

(Sambrook et al., 1990), resuspended in 2 ml PBS and passed through a 0.45 μ m filter (Minisart NML; Sartorius) to give a final concentration of approximately 10^{13} transducing units/ml (ampicillin-resistant clones).

Panning of the Library. Immuntubes (Nunc) are coated overnight in PBS with 4 ml of either 100 μ g/ml or 10 μ g/ml of a polypeptide of the present invention. Tubes are blocked with 2% Marvel-PBS for 2 hours at 37°C and then washed 3 times in PBS. Approximately 10^{13} TU of phage is applied to the tube and incubated for 30 minutes at room temperature tumbling on an over and under turntable and then left to stand for another 1.5 hours. Tubes are washed 10 times with PBS 0.1% Tween-20 and 10 times with PBS. Phage are eluted by adding 1 ml of 100 mM triethylamine and rotating 15 minutes on an under and over turntable after which the solution is immediately neutralized with 0.5 ml of 1.0M Tris-HCl, pH 7.4. Phage are then used to infect 10 ml of mid-log E. coli TG1 by incubating eluted phage with bacteria for 30 minutes at 37°C. The E. coli are then plated on TYE plates containing 1% glucose and 100 μ g/ml ampicillin. The resulting bacterial library is then rescued with delta gene 3 helper phage as described above to prepare phage for a subsequent round of selection. This process is then repeated for a total of 4 rounds of affinity purification with tube-washing increased to 20 times with PBS, 0.1% Tween-20 and 20 times with PBS for rounds 3 and 4.

Characterization of Binders. Eluted phage from the 3rd and 4th rounds of selection are used to infect E. coli HB 2151 and soluble scFv is produced (Marks, et al., 1991) from single colonies for assay. ELISAs are performed with microtitre plates coated with either 10 pg/ml of the polypeptide of the present invention in 50 mM bicarbonate pH 9.6. Clones positive in ELISA are further characterized by PCR fingerprinting (see, e.g., PCT publication WO 92/01047) and then by sequencing. These ELISA positive clones may also be further characterized by techniques known in the art, such as, for example, epitope mapping, binding affinity, receptor signal transduction, ability to block or competitively inhibit antibody/antigen binding, and competitive agonistic or antagonistic activity.

Example 11: Method of Determining Alterations in a Gene Corresponding to a Polynucleotide

RNA isolated from entire families or individual patients presenting with a phenotype of interest (such as a disease) is be isolated. cDNA is then generated from these RNA samples using protocols known in the art. (See, Sambrook.) The cDNA is then used as a template for PCR, employing primers surrounding regions of interest in SEQ ID NO:X; and/or the nucleotide sequence of the related cDNA in the cDNA clone contained in a deposited library. Suggested PCR conditions consist of 35 cycles at 95 degrees C for 30 seconds; 60-120 seconds at 52-58 degrees C; and 60-120 seconds at 70 degrees C, using buffer solutions described in Sidransky et al., Science 252:706 (1991).

PCR products are then sequenced using primers labeled at their 5' end with T4 polynucleotide kinase, employing SequiTherm Polymerase. (Epicentre Technologies). The intron-exon borders of selected exons is also determined and genomic PCR products analyzed to confirm the results. PCR products harboring suspected mutations is then cloned and sequenced to validate the results of the direct sequencing.

PCR products is cloned into T-tailed vectors as described in Holton et al., Nucleic Acids Research, 19:1156 (1991) and sequenced with T7 polymerase (United States Biochemical). Affected individuals are identified by mutations not present in unaffected individuals.

Genomic rearrangements are also observed as a method of determining alterations in a gene corresponding to a polynucleotide. Genomic clones isolated according to Example 2 are nick-translated with digoxigenindeoxy-uridine 5'-triphosphate (Boehringer Mannheim), and FISH performed as described in Johnson et al., Methods Cell Biol. 35:73-99 (1991). Hybridization with the labeled probe is carried out using a vast excess of human cot-1 DNA for specific hybridization to the corresponding genomic locus.

Chromosomes are counterstained with 4,6-diamino-2-phenylidole and propidium iodide, producing a combination of C- and R-bands. Aligned images for precise mapping are obtained using a triple-band filter set (Chroma Technology, Brattleboro, VT) in combination with a cooled charge-coupled device camera (Photometrics, Tucson, AZ) and variable excitation wavelength filters. (Johnson et al., Genet. Anal. Tech. Appl., 8:75 (1991).) Image collection, analysis and chromosomal fractional length measurements are performed using the ISee Graphical Program System. (Inovision Corporation, Durham, NC.) Chromosome alterations of the genomic region hybridized by the probe are identified as insertions, deletions, and translocations. These alterations are used as a diagnostic marker for an

associated disease.

Example 12: Method of Detecting Abnormal Levels of a Polypeptide in a Biological Sample

5 A polypeptide of the present invention can be detected in a biological sample, and if an increased or decreased level of the polypeptide is detected, this polypeptide is a marker for a particular phenotype. Methods of detection are numerous, and thus, it is understood that one skilled in the art can modify the following assay to fit their particular needs.

10 For example, antibody-sandwich ELISAs are used to detect polypeptides in a sample, preferably a biological sample. Wells of a microtiter plate are coated with specific antibodies, at a final concentration of 0.2 to 10 ug/ml. The antibodies are either monoclonal or polyclonal and are produced by the method described in Example 10. The wells are blocked so that non-specific binding of the polypeptide to the well is reduced.

15 The coated wells are then incubated for > 2 hours at RT with a sample containing the polypeptide. Preferably, serial dilutions of the sample should be used to validate results. The plates are then washed three times with deionized or distilled water to remove unbounded polypeptide.

20 Next, 50 ul of specific antibody-alkaline phosphatase conjugate, at a concentration of 25-400 ng, is added and incubated for 2 hours at room temperature. The plates are again washed three times with deionized or distilled water to remove unbounded conjugate.

25 Add 75 ul of 4-methylumbelliferyl phosphate (MUP) or p-nitrophenyl phosphate (NPP) substrate solution to each well and incubate 1 hour at room temperature. Measure the reaction by a microtiter plate reader. Prepare a standard curve, using serial dilutions of a control sample, and plot polypeptide concentration on the X-axis (log scale) and fluorescence or absorbance of the Y-axis (linear scale). Interpolate the concentration of the polypeptide in the sample using the standard curve.

Example 13: Formulation

30 The invention also provides methods of treatment and/or prevention of diseases or disorders (such as, for example, any one or more of the diseases or disorders disclosed

herein) by administration to a subject of an effective amount of a Therapeutic. By therapeutic is meant a polynucleotides or polypeptides of the invention (including fragments and variants), agonists or antagonists thereof, and/or antibodies thereto, in combination with a pharmaceutically acceptable carrier type (e.g., a sterile carrier).

5 The Therapeutic will be formulated and dosed in a fashion consistent with good medical practice, taking into account the clinical condition of the individual patient (especially the side effects of treatment with the Therapeutic alone), the site of delivery, the method of administration, the scheduling of administration, and other factors known to practitioners. The "effective amount" for purposes herein is thus determined by such
10 considerations.

As a general proposition, the total pharmaceutically effective amount of the Therapeutic administered parenterally per dose will be in the range of about 1ug/kg/day to 10 mg/kg/day of patient body weight, although, as noted above, this will be subject to therapeutic discretion. More preferably, this dose is at least 0.01 mg/kg/day, and most
15 preferably for humans between about 0.01 and 1 mg/kg/day for the hormone. If given continuously, the Therapeutic is typically administered at a dose rate of about 1 ug/kg/hour to about 50 ug/kg/hour, either by 1-4 injections per day or by continuous subcutaneous infusions, for example, using a mini-pump. An intravenous bag solution may also be employed. The length of treatment needed to observe changes and the interval following
20 treatment for responses to occur appears to vary depending on the desired effect.

Therapeutics can be administered orally, rectally, parenterally, intracisternally, intravaginally, intraperitoneally, topically (as by powders, ointments, gels, drops or transdermal patch), buccally, or as an oral or nasal spray. "Pharmaceutically acceptable carrier" refers to a non-toxic solid, semisolid or liquid filler, diluent, encapsulating material
25 or formulation auxiliary of any. The term "parenteral" as used herein refers to modes of administration which include intravenous, intramuscular, intraperitoneal, intrasternal, subcutaneous and intraarticular injection and infusion.

Therapeutics of the invention are also suitably administered by sustained-release systems. Suitable examples of sustained-release Therapeutics are administered orally,
30 rectally, parenterally, intracisternally, intravaginally, intraperitoneally, topically (as by powders, ointments, gels, drops or transdermal patch), buccally, or as an oral or nasal spray. "Pharmaceutically acceptable carrier" refers to a non-toxic solid, semisolid or liquid filler,

diluent, encapsulating material or formulation auxiliary of any type. The term "parenteral" as used herein refers to modes of administration which include intravenous, intramuscular, intraperitoneal, intrasternal, subcutaneous and intraarticular injection and infusion.

Therapeutics of the invention are also suitably administered by sustained-release systems. Suitable examples of sustained-release Therapeutics include suitable polymeric materials (such as, for example, semi-permeable polymer matrices in the form of shaped articles, e.g., films, or microcapsules), suitable hydrophobic materials (for example as an emulsion in an acceptable oil) or ion exchange resins, and sparingly soluble derivatives (such as, for example, a sparingly soluble salt).

Sustained-release matrices include polylactides (U.S. Pat. No. 3,773,919, EP 58,481), copolymers of L-glutamic acid and gamma-ethyl-L-glutamate (Sidman et al., *Biopolymers* 22:547-556 (1983)), poly (2- hydroxyethyl methacrylate) (Langer et al., *J. Biomed. Mater. Res.* 15:167-277 (1981), and Langer, *Chem. Tech.* 12:98-105 (1982)), ethylene vinyl acetate (Langer et al., *Id.*) or poly-D- (-)-3-hydroxybutyric acid (EP 133,988).

Sustained-release Therapeutics also include liposomally entrapped Therapeutics of the invention (*see* generally, Langer, *Science* 249:1527-1533 (1990); Treat et al., in *Liposomes in the Therapy of Infectious Disease and Cancer*, Lopez-Berestein and Fidler (eds.), Liss, New York, pp. 317 -327 and 353-365 (1989)). Liposomes containing the Therapeutic are prepared by methods known per se: DE 3,218,121; Epstein et al., *Proc. Natl. Acad. Sci. (USA)* 82:3688-3692 (1985); Hwang et al., *Proc. Natl. Acad. Sci.(USA)* 77:4030-4034 (1980); EP 52,322; EP 36,676; EP 88,046; EP 143,949; EP 142,641; Japanese Pat. Appl. 83-118008; U.S. Pat. Nos. 4,485,045 and 4,544,545; and EP 102,324. Ordinarily, the liposomes are of the small (about 200-800 Angstroms) unilamellar type in which the lipid content is greater than about 30 mol. percent cholesterol, the selected proportion being adjusted for the optimal Therapeutic.

In yet an additional embodiment, the Therapeutics of the invention are delivered by way of a pump (*see* Langer, *supra*; Sefton, *CRC Crit. Ref. Biomed. Eng.* 14:201 (1987); Buchwald et al., *Surgery* 88:507 (1980); Saudek et al., *N. Engl. J. Med.* 321:574 (1989)).

Other controlled release systems are discussed in the review by Langer (*Science* 249:1527-1533 (1990)).

For parenteral administration, in one embodiment, the Therapeutic is formulated generally by mixing it at the desired degree of purity, in a unit dosage injectable form

(solution, suspension, or emulsion), with a pharmaceutically acceptable carrier, i.e., one that is non-toxic to recipients at the dosages and concentrations employed and is compatible with other ingredients of the formulation. For example, the formulation preferably does not include oxidizing agents and other compounds that are known to be deleterious to the

5 Therapeutic.

Generally, the formulations are prepared by contacting the Therapeutic uniformly and intimately with liquid carriers or finely divided solid carriers or both. Then, if necessary, the product is shaped into the desired formulation. Preferably the carrier is a parenteral carrier, more preferably a solution that is isotonic with the blood of the recipient. Examples of such
10 carrier vehicles include water, saline, Ringer's solution, and dextrose solution. Non-aqueous vehicles such as fixed oils and ethyl oleate are also useful herein, as well as liposomes.

The carrier suitably contains minor amounts of additives such as substances that enhance isotonicity and chemical stability. Such materials are non-toxic to recipients at the dosages and concentrations employed, and include buffers such as phosphate, citrate,
15 succinate, acetic acid, and other organic acids or their salts; antioxidants such as ascorbic acid; low molecular weight (less than about ten residues) polypeptides, e.g., polyarginine or tripeptides; proteins, such as serum albumin, gelatin, or immunoglobulins; hydrophilic polymers such as polyvinylpyrrolidone; amino acids, such as glycine, glutamic acid, aspartic acid, or arginine; monosaccharides, disaccharides, and other carbohydrates including
20 cellulose or its derivatives, glucose, manose, or dextrans; chelating agents such as EDTA; sugar alcohols such as mannitol or sorbitol; counterions such as sodium; and/or nonionic surfactants such as polysorbates, poloxamers, or PEG.

The Therapeutic is typically formulated in such vehicles at a concentration of about 0.1 mg/ml to 100 mg/ml, preferably 1-10 mg/ml, at a pH of about 3 to 8. It will be
25 understood that the use of certain of the foregoing excipients, carriers, or stabilizers will result in the formation of polypeptide salts.

Any pharmaceutical used for therapeutic administration can be sterile. Sterility is readily accomplished by filtration through sterile filtration membranes (e.g., 0.2 micron membranes). Therapeutics generally are placed into a container having a sterile access port,
30 for example, an intravenous solution bag or vial having a stopper pierceable by a hypodermic injection needle.

Therapeutics ordinarily will be stored in unit or multi-dose containers, for example,

sealed ampoules or vials, as an aqueous solution or as a lyophilized formulation for reconstitution. As an example of a lyophilized formulation, 10-ml vials are filled with 5 ml of sterile-filtered 1% (w/v) aqueous Therapeutic solution, and the resulting mixture is lyophilized. The infusion solution is prepared by reconstituting the lyophilized Therapeutic
5 using bacteriostatic Water-for-Injection.

The invention also provides a pharmaceutical pack or kit comprising one or more containers filled with one or more of the ingredients of the Therapeutics of the invention. Associated with such container(s) can be a notice in the form prescribed by a governmental agency regulating the manufacture, use or sale of pharmaceuticals or biological products,
10 which notice reflects approval by the agency of manufacture, use or sale for human administration. In addition, the Therapeutics may be employed in conjunction with other therapeutic compounds.

The Therapeutics of the invention may be administered alone or in combination with adjuvants. Adjuvants that may be administered with the Therapeutics of the invention
15 include, but are not limited to, alum, alum plus deoxycholate (ImmunoAg), MTP-PE (Biocine Corp.), QS21 (Genentech, Inc.), BCG, and MPL. In a specific embodiment, Therapeutics of the invention are administered in combination with alum. In another specific embodiment, Therapeutics of the invention are administered in combination with QS-21. Further adjuvants that may be administered with the Therapeutics of the invention include,
20 but are not limited to, Monophosphoryl lipid immunomodulator, AdjuVax 100a, QS-21, QS-18, CRL1005, Aluminum salts, MF-59, and Virosomal adjuvant technology. Vaccines that may be administered with the Therapeutics of the invention include, but are not limited to, vaccines directed toward protection against MMR (measles, mumps, rubella), polio, varicella, tetanus/diphtheria, hepatitis A, hepatitis B, haemophilus influenzae B, whooping
25 cough, pneumonia, influenza, Lyme's Disease, rotavirus, cholera, yellow fever, Japanese encephalitis, poliomyelitis, rabies, typhoid fever, and pertussis. Combinations may be administered either concomitantly, e.g., as an admixture, separately but simultaneously or concurrently; or sequentially. This includes presentations in which the combined agents are administered together as a therapeutic mixture, and also procedures in which the combined
30 agents are administered separately but simultaneously, e.g., as through separate intravenous lines into the same individual. Administration "in combination" further includes the separate administration of one of the compounds or agents given first, followed by the second.

The Therapeutics of the invention may be administered alone or in combination with other therapeutic agents. Therapeutic agents that may be administered in combination with the Therapeutics of the invention, include but not limited to, other members of the TNF family, chemotherapeutic agents, antibiotics, steroidal and non-steroidal anti-inflammatories, conventional immunotherapeutic agents, cytokines and/or growth factors. Combinations may be administered either concomitantly, e.g., as an admixture, separately but simultaneously or concurrently; or sequentially. This includes presentations in which the combined agents are administered together as a therapeutic mixture, and also procedures in which the combined agents are administered separately but simultaneously, e.g., as through separate intravenous lines into the same individual. Administration "in combination" further includes the separate administration of one of the compounds or agents given first, followed by the second.

In one embodiment, the Therapeutics of the invention are administered in combination with members of the TNF family. TNF, TNF-related or TNF-like molecules that may be administered with the Therapeutics of the invention include, but are not limited to, soluble forms of TNF-alpha, lymphotoxin-alpha (LT-alpha, also known as TNF-beta), LT-beta (found in complex heterotrimer LT-alpha2-beta), OPGL, FasL, CD27L, CD30L, CD40L, 4-1BBL, DcR3, OX40L, TNF-gamma (International Publication No. WO 96/14328), AIM-I (International Publication No. WO 97/33899), endokine-alpha (International Publication No. WO 98/07880), TR6 (International Publication No. WO 98/30694), OPG, and neutrokin-alpha (International Publication No. WO 98/18921, OX40, and nerve growth factor (NGF), and soluble forms of Fas, CD30, CD27, CD40 and 4-1BB, TR2 (International Publication No. WO 96/34095), DR3 (International Publication No. WO 97/33904), DR4 (International Publication No. WO 98/32856), TR5 (International Publication No. WO 98/30693), TR6 (International Publication No. WO 98/30694), TR7 (International Publication No. WO 98/41629), TRANK, TR9 (International Publication No. WO 98/56892), TR10 (International Publication No. WO 98/54202), 312C2 (International Publication No. WO 98/06842), and TR12, and soluble forms CD154, CD70, and CD153.

In certain embodiments, Therapeutics of the invention are administered in combination with antiretroviral agents, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and/or protease inhibitors. Nucleoside reverse transcriptase inhibitors that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, RETROVIR™ (zidovudine/AZT), VIDEX™

(didanosine/ddI), HIVID™ (zalcitabine/ddC), ZERIT™ (stavudine/d4T), EPIVIR™ (lamivudine/3TC), and COMBIVIR™ (zidovudine/lamivudine). Non-nucleoside reverse transcriptase inhibitors that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, VIRAMUNE™ (nevirapine), RESCRIPTOR™ (delavirdine), and SUSTIVA™ (efavirenz). Protease inhibitors that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, CRIXIVAN™ (indinavir), NORVIR™ (ritonavir), INVIRASE™ (saquinavir), and VIRACEPT™ (nelfinavir). In a specific embodiment, antiretroviral agents, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and/or protease inhibitors may be used in any combination with Therapeutics of the invention to treat AIDS and/or to prevent or treat HIV infection.

In other embodiments, Therapeutics of the invention may be administered in combination with anti-opportunistic infection agents. Anti-opportunistic agents that may be administered in combination with the Therapeutics of the invention, include, but are not limited to, TRIMETHOPRIM-SULFAMETHOXAZOLE™, DAPSONE™, PENTAMIDINE™, ATOVAQUONE™, ISONIAZID™, RIFAMPIN™, PYRAZINAMIDE™, ETHAMBUTOL™, RIFABUTIN™, CLARITHROMYCIN™, AZITHROMYCIN™, GANCICLOVIR™, FOSCARNET™, CIDOFOVIR™, FLUCONAZOLE™, ITRACONAZOLE™, KETOCONAZOLE™, ACYCLOVIR™, FAMCICLOVIR™, PYRIMETHAMINE™, LEUCOVORIN™, NEUPOGEN™ (filgrastim/G-CSF), and LEUKINE™ (sargramostim/GM-CSF). In a specific embodiment, Therapeutics of the invention are used in any combination with TRIMETHOPRIM-SULFAMETHOXAZOLE™, DAPSONE™, PENTAMIDINE™, and/or ATOVAQUONE™ to prophylactically treat or prevent an opportunistic *Pneumocystis carinii* pneumonia infection. In another specific embodiment, Therapeutics of the invention are used in any combination with ISONIAZID™, RIFAMPIN™, PYRAZINAMIDE™, and/or ETHAMBUTOL™ to prophylactically treat or prevent an opportunistic *Mycobacterium avium* complex infection. In another specific embodiment, Therapeutics of the invention are used in any combination with RIFABUTIN™, CLARITHROMYCIN™, and/or AZITHROMYCIN™ to prophylactically treat or prevent an opportunistic *Mycobacterium tuberculosis* infection. In another specific embodiment, Therapeutics of the invention are used in any combination with GANCICLOVIR™,

FOSCARNET™, and/or CIDOFOVIR™ to prophylactically treat or prevent an opportunistic cytomegalovirus infection. In another specific embodiment, Therapeutics of the invention are used in any combination with FLUCONAZOLE™, ITRACONAZOLE™, and/or KETOCONAZOLE™ to prophylactically treat or prevent an opportunistic fungal infection.

- 5 In another specific embodiment, Therapeutics of the invention are used in any combination with ACYCLOVIR™ and/or FAMCICOLVIR™ to prophylactically treat or prevent an opportunistic herpes simplex virus type I and/or type II infection. In another specific embodiment, Therapeutics of the invention are used in any combination with PYRIMETHAMINE™ and/or LEUCOVORIN™ to prophylactically treat or prevent an
- 10 opportunistic *Toxoplasma gondii* infection. In another specific embodiment, Therapeutics of the invention are used in any combination with LEUCOVORIN™ and/or NEUPOGEN™ to prophylactically treat or prevent an opportunistic bacterial infection.

In a further embodiment, the Therapeutics of the invention are administered in combination with an antiviral agent. Antiviral agents that may be administered with the

15 Therapeutics of the invention include, but are not limited to, acyclovir, ribavirin, amantadine, and remantidine.

In a further embodiment, the Therapeutics of the invention are administered in combination with an antibiotic agent. Antibiotic agents that may be administered with the Therapeutics of the invention include, but are not limited to, amoxicillin, beta-lactamases,

20 aminoglycosides, beta-lactam (glycopeptide), beta-lactamases, Clindamycin, chloramphenicol, cephalosporins, ciprofloxacin, ciprofloxacin, erythromycin, fluoroquinolones, macrolides, metronidazole, penicillins, quinolones, rifampin, streptomycin, sulfonamide, tetracyclines, trimethoprim, trimethoprim-sulfamthoxazole, and vancomycin.

Conventional nonspecific immunosuppressive agents, that may be administered in

25 combination with the Therapeutics of the invention include, but are not limited to, steroids, cyclosporine, cyclosporine analogs, cyclophosphamide methylprednisone, prednisone, azathioprine, FK-506, 15-deoxyspergualin, and other immunosuppressive agents that act by suppressing the function of responding T cells.

In specific embodiments, Therapeutics of the invention are administered in

30 combination with immunosuppressants. Immunosuppressants preparations that may be administered with the Therapeutics of the invention include, but are not limited to, ORTHOCLONE™ (OKT3), SANDIMMUNE™/NEORAL™/SANGDYA™ (cyclosporin),

PROGRAF™ (tacrolimus), CELLCEPT™ (mycophenolate), Azathioprine, glucocorticosteroids, and RAPAMUNE™ (sirolimus). In a specific embodiment, immunosuppressants may be used to prevent rejection of organ or bone marrow transplantation.

In an additional embodiment, Therapeutics of the invention are administered alone or
5 in combination with one or more intravenous immune globulin preparations. Intravenous immune globulin preparations that may be administered with the Therapeutics of the invention include, but not limited to, GAMMAR™, IVEEGAM™, SANDOGLOBULIN™, GAMMAGARD S/D™, and GAMIMUNE™. In a specific embodiment, Therapeutics of the invention are administered in combination with intravenous immune globulin preparations in
10 transplantation therapy (e.g., bone marrow transplant).

In an additional embodiment, the Therapeutics of the invention are administered alone or in combination with an anti-inflammatory agent. Anti-inflammatory agents that may be administered with the Therapeutics of the invention include, but are not limited to, glucocorticoids and the nonsteroidal anti-inflammatories, aminoarylcarboxylic acid
15 derivatives, arylacetic acid derivatives, arylbutyric acid derivatives, arylcarboxylic acids, arylpropionic acid derivatives, pyrazoles, pyrazolones, salicylic acid derivatives, thiazinecarboxamides, e-acetamidocaproic acid, S-adenosylmethionine, 3-amino-4-hydroxybutyric acid, amixetrine, bendazac, benzydamine, bucolome, difenpiramide, ditazol, emorfazone, guaiazulene, nabumetone, nimesulide, orgotein, oxaceprol, paranyline,
20 perisoxal, pifoxime, proquazone, proxazole, and tenidap.

In another embodiment, compositions of the invention are administered in combination with a chemotherapeutic agent. Chemotherapeutic agents that may be administered with the Therapeutics of the invention include, but are not limited to, antibiotic derivatives (e.g., doxorubicin, bleomycin, daunorubicin, and dactinomycin); antiestrogens
25 (e.g., tamoxifen); antimetabolites (e.g., fluorouracil, 5-FU, methotrexate, floxuridine, interferon alpha-2b, glutamic acid, plicamycin, mercaptopurine, and 6-thioguanine); cytotoxic agents (e.g., carmustine, BCNU, lomustine, CCNU, cytosine arabinoside, cyclophosphamide, estramustine, hydroxyurea, procarbazine, mitomycin, busulfan, cis-platin, and vincristine sulfate); hormones (e.g., medroxyprogesterone, estramustine phosphate
30 sodium, ethinyl estradiol, estradiol, megestrol acetate, methyltestosterone, diethylstilbestrol diphosphate, chlorotrianisene, and testolactone); nitrogen mustard derivatives (e.g., mephalen, chorambucil, mechlorethamine (nitrogen mustard) and thiotepa); steroids and

combinations (e.g., bethamethasone sodium phosphate); and others (e.g., dicarbazine, asparaginase, mitotane, vincristine sulfate, vinblastine sulfate, and etoposide).

In a specific embodiment, Therapeutics of the invention are administered in combination with CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone) or
5 any combination of the components of CHOP. In another embodiment, Therapeutics of the invention are administered in combination with Rituximab. In a further embodiment, Therapeutics of the invention are administered with Rituxmab and CHOP, or Rituxmab and any combination of the components of CHOP.

In an additional embodiment, the Therapeutics of the invention are administered in
10 combination with cytokines. Cytokines that may be administered with the Therapeutics of the invention include, but are not limited to, IL2, IL3, IL4, IL5, IL6, IL7, IL10, IL12, IL13, IL15, anti-CD40, CD40L, IFN-gamma and TNF-alpha. In another embodiment, Therapeutics of the invention may be administered with any interleukin, including, but not limited to, IL-1alpha, IL-1beta, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-11,
15 IL-12, IL-13, IL-14, IL-15, IL-16, IL-17, IL-18, IL-19, IL-20, and IL-21.

In an additional embodiment, the Therapeutics of the invention are administered in combination with angiogenic proteins. Angiogenic proteins that may be administered with the Therapeutics of the invention include, but are not limited to, Glioma Derived Growth Factor (GDGF), as disclosed in European Patent Number EP-399816; Platelet Derived
20 Growth Factor-A (PDGF-A), as disclosed in European Patent Number EP-682110; Platelet Derived Growth Factor-B (PDGF-B), as disclosed in European Patent Number EP-282317; Placental Growth Factor (PIGF), as disclosed in International Publication Number WO 92/06194; Placental Growth Factor-2 (PIGF-2), as disclosed in Hauser et al., Growth Factors, 4:259-268 (1993); Vascular Endothelial Growth Factor (VEGF), as disclosed in International
25 Publication Number WO 90/13649; Vascular Endothelial Growth Factor-A (VEGF-A), as disclosed in European Patent Number EP-506477; Vascular Endothelial Growth Factor-2 (VEGF-2), as disclosed in International Publication Number WO 96/39515; Vascular Endothelial Growth Factor B (VEGF-3); Vascular Endothelial Growth Factor B-186 (VEGF-B186), as disclosed in International Publication Number WO 96/26736; Vascular Endothelial
30 Growth Factor-D (VEGF-D), as disclosed in International Publication Number WO 98/02543; Vascular Endothelial Growth Factor-D (VEGF-D), as disclosed in International Publication Number WO 98/07832; and Vascular Endothelial Growth Factor-E (VEGF-E), as

disclosed in German Patent Number DE19639601. The above mentioned references are incorporated herein by reference herein.

In an additional embodiment, the Therapeutics of the invention are administered in combination with hematopoietic growth factors. Hematopoietic growth factors that may be administered with the Therapeutics of the invention include, but are not limited to, LEUKINE™ (SARGRAMOSTIM™) and NEUPOGEN™ (FILGRASTIM™).

In an additional embodiment, the Therapeutics of the invention are administered in combination with Fibroblast Growth Factors. Fibroblast Growth Factors that may be administered with the Therapeutics of the invention include, but are not limited to, FGF-1, FGF-2, FGF-3, FGF-4, FGF-5, FGF-6, FGF-7, FGF-8, FGF-9, FGF-10, FGF-11, FGF-12, FGF-13, FGF-14, and FGF-15.

In additional embodiments, the Therapeutics of the invention are administered in combination with other therapeutic or prophylactic regimens, such as, for example, radiation therapy.

Example 14: Method of Treating Decreased Levels of the Polypeptide

The present invention relates to a method for treating an individual in need of an increased level of a polypeptide of the invention in the body comprising administering to such an individual a composition comprising a therapeutically effective amount of an agonist of the invention (including polypeptides of the invention). Moreover, it will be appreciated that conditions caused by a decrease in the standard or normal expression level of a polypeptide of the present invention in an individual can be treated by administering the agonist or antagonist of the present invention. Thus, the invention also provides a method of treatment of an individual in need of an increased level of the polypeptide comprising administering to such an individual a Therapeutic comprising an amount of the agonist or antagonist to increase the activity level of the polypeptide in such an individual.

For example, a patient with decreased levels of a polypeptide receives a daily dose 0.1-100 ug/kg of the agonist or antagonist for six consecutive days. The exact details of the dosing scheme, based on administration and formulation, are provided in Example 13.

Example 15: Method of Treating Increased Levels of the Polypeptide

The present invention also relates to a method of treating an individual in need of a decreased level of a polypeptide of the invention in the body comprising administering to such an individual a composition comprising a therapeutically effective amount of an antagonist of the invention (including polypeptides and antibodies of the invention).

In one example, antisense technology is used to inhibit production of a polypeptide of the present invention. This technology is one example of a method of decreasing levels of a polypeptide, due to a variety of etiologies, such as cancer.

For example, a patient diagnosed with abnormally increased levels of a polypeptide is administered intravenously antisense polynucleotides at 0.5, 1.0, 1.5, 2.0 and 3.0 mg/kg day for 21 days. This treatment is repeated after a 7-day rest period if the treatment was well tolerated. The formulation of the antisense polynucleotide is provided in Example 13.

Example 16: Method of Treatment Using Gene Therapy-Ex Vivo

One method of gene therapy transplants fibroblasts, which are capable of expressing a polypeptide, onto a patient. Generally, fibroblasts are obtained from a subject by skin biopsy. The resulting tissue is placed in tissue-culture medium and separated into small pieces. Small chunks of the tissue are placed on a wet surface of a tissue culture flask, approximately ten pieces are placed in each flask. The flask is turned upside down, closed tight and left at room temperature over night. After 24 hours at room temperature, the flask is inverted and the chunks of tissue remain fixed to the bottom of the flask and fresh media (e.g., Ham's F12 media, with 10% FBS, penicillin and streptomycin) is added. The flasks are then incubated at 37 degree C for approximately one week.

At this time, fresh media is added and subsequently changed every several days. After an additional two weeks in culture, a monolayer of fibroblasts emerge. The monolayer is trypsinized and scaled into larger flasks.

pMV-7 (Kirschmeier, P.T. et al., DNA, 7:219-25 (1988)), flanked by the long terminal repeats of the Moloney murine sarcoma virus, is digested with EcoRI and HindIII and subsequently treated with calf intestinal phosphatase. The linear vector is fractionated on agarose gel and purified, using glass beads.

The cDNA encoding a polypeptide of the present invention can be amplified using

PCR primers which correspond to the 5' and 3' end sequences respectively as set forth in Example 1 using primers and having appropriate restriction sites and initiation/stop codons, if necessary. Preferably, the 5' primer contains an EcoRI site and the 3' primer includes a HindIII site. Equal quantities of the Moloney murine sarcoma virus linear backbone and the amplified EcoRI and HindIII fragment are added together, in the presence of T4 DNA ligase. The resulting mixture is maintained under conditions appropriate for ligation of the two fragments. The ligation mixture is then used to transform bacteria HB101, which are then plated onto agar containing kanamycin for the purpose of confirming that the vector has the gene of interest properly inserted.

The amphotropic pA317 or GP+am12 packaging cells are grown in tissue culture to confluent density in Dulbecco's Modified Eagles Medium (DMEM) with 10% calf serum (CS), penicillin and streptomycin. The MSV vector containing the gene is then added to the media and the packaging cells transduced with the vector. The packaging cells now produce infectious viral particles containing the gene (the packaging cells are now referred to as producer cells).

Fresh media is added to the transduced producer cells, and subsequently, the media is harvested from a 10 cm plate of confluent producer cells. The spent media, containing the infectious viral particles, is filtered through a millipore filter to remove detached producer cells and this media is then used to infect fibroblast cells. Media is removed from a sub-confluent plate of fibroblasts and quickly replaced with the media from the producer cells. This media is removed and replaced with fresh media. If the titer of virus is high, then virtually all fibroblasts will be infected and no selection is required. If the titer is very low, then it is necessary to use a retroviral vector that has a selectable marker, such as neo or his. Once the fibroblasts have been efficiently infected, the fibroblasts are analyzed to determine whether protein is produced.

The engineered fibroblasts are then transplanted onto the host, either alone or after having been grown to confluence on cytodex 3 microcarrier beads.

Example 17: Gene Therapy Using Endogenous Genes Corresponding To Polynucleotides of the Invention

Another method of gene therapy according to the present invention involves operably

associating the endogenous polynucleotide sequence of the invention with a promoter via homologous recombination as described, for example, in U.S. Patent NO: 5,641,670, issued June 24, 1997; International Publication NO: WO 96/29411, published September 26, 1996; International Publication NO: WO 94/12650, published August 4, 1994; Koller et al., *Proc. Natl. Acad. Sci. USA*, 86:8932-8935 (1989); and Zijlstra et al., *Nature*, 342:435-438 (1989). This method involves the activation of a gene which is present in the target cells, but which is not expressed in the cells, or is expressed at a lower level than desired.

Polynucleotide constructs are made which contain a promoter and targeting sequences, which are homologous to the 5' non-coding sequence of endogenous polynucleotide sequence, flanking the promoter. The targeting sequence will be sufficiently near the 5' end of the polynucleotide sequence so the promoter will be operably linked to the endogenous sequence upon homologous recombination. The promoter and the targeting sequences can be amplified using PCR. Preferably, the amplified promoter contains distinct restriction enzyme sites on the 5' and 3' ends. Preferably, the 3' end of the first targeting sequence contains the same restriction enzyme site as the 5' end of the amplified promoter and the 5' end of the second targeting sequence contains the same restriction site as the 3' end of the amplified promoter.

The amplified promoter and the amplified targeting sequences are digested with the appropriate restriction enzymes and subsequently treated with calf intestinal phosphatase. The digested promoter and digested targeting sequences are added together in the presence of T4 DNA ligase. The resulting mixture is maintained under conditions appropriate for ligation of the two fragments. The construct is size fractionated on an agarose gel then purified by phenol extraction and ethanol precipitation.

In this Example, the polynucleotide constructs are administered as naked polynucleotides via electroporation. However, the polynucleotide constructs may also be administered with transfection-facilitating agents, such as liposomes, viral sequences, viral particles, precipitating agents, etc. Such methods of delivery are known in the art.

Once the cells are transfected, homologous recombination will take place which results in the promoter being operably linked to the endogenous polynucleotide sequence. This results in the expression of polynucleotide corresponding to the polynucleotide in the cell. Expression may be detected by immunological staining, or any other method known in the art.

Fibroblasts are obtained from a subject by skin biopsy. The resulting tissue is placed in DMEM + 10% fetal calf serum. Exponentially growing or early stationary phase fibroblasts are trypsinized and rinsed from the plastic surface with nutrient medium. An aliquot of the cell suspension is removed for counting, and the remaining cells are subjected to centrifugation. The supernatant is aspirated and the pellet is resuspended in 5 ml of electroporation buffer (20 mM HEPES pH 7.3, 137 mM NaCl, 5 mM KCl, 0.7 mM Na₂HPO₄, 6 mM dextrose). The cells are recentrifuged, the supernatant aspirated, and the cells resuspended in electroporation buffer containing 1 mg/ml acetylated bovine serum albumin. The final cell suspension contains approximately 3×10^6 cells/ml. Electroporation should be performed immediately following resuspension.

Plasmid DNA is prepared according to standard techniques. For example, to construct a plasmid for targeting to the locus corresponding to the polynucleotide of the invention, plasmid pUC18 (MBI Fermentas, Amherst, NY) is digested with HindIII. The CMV promoter is amplified by PCR with an XbaI site on the 5' end and a BamHI site on the 3' end. Two non-coding sequences are amplified via PCR: one non-coding sequence (fragment 1) is amplified with a HindIII site at the 5' end and an Xba site at the 3' end; the other non-coding sequence (fragment 2) is amplified with a BamHI site at the 5' end and a HindIII site at the 3' end. The CMV promoter and the fragments (1 and 2) are digested with the appropriate enzymes (CMV promoter - XbaI and BamHI; fragment 1 - XbaI; fragment 2 - BamHI) and ligated together. The resulting ligation product is digested with HindIII, and ligated with the HindIII-digested pUC18 plasmid.

Plasmid DNA is added to a sterile cuvette with a 0.4 cm electrode gap (Bio-Rad). The final DNA concentration is generally at least 120 µg/ml. 0.5 ml of the cell suspension (containing approximately 1.5×10^6 cells) is then added to the cuvette, and the cell suspension and DNA solutions are gently mixed. Electroporation is performed with a Gene-Pulser apparatus (Bio-Rad). Capacitance and voltage are set at 960 µF and 250-300 V, respectively. As voltage increases, cell survival decreases, but the percentage of surviving cells that stably incorporate the introduced DNA into their genome increases dramatically. Given these parameters, a pulse time of approximately 14-20 mSec should be observed.

Electroporated cells are maintained at room temperature for approximately 5 min, and the contents of the cuvette are then gently removed with a sterile transfer pipette. The cells are added directly to 10 ml of prewarmed nutrient media (DMEM with 15% calf serum) in a

10 cm dish and incubated at 37 degree C. The following day, the media is aspirated and replaced with 10 ml of fresh media and incubated for a further 16-24 hours.

The engineered fibroblasts are then injected into the host, either alone or after having been grown to confluence on cytodex 3 microcarrier beads. The fibroblasts now produce the protein product. The fibroblasts can then be introduced into a patient as described above.

Example 18: Method of Treatment Using Gene Therapy - In Vivo

Another aspect of the present invention is using *in vivo* gene therapy methods to treat disorders, diseases and conditions. The gene therapy method relates to the introduction of naked nucleic acid (DNA, RNA, and antisense DNA or RNA) sequences into an animal to increase or decrease the expression of the polypeptide. The polynucleotide of the present invention may be operatively linked to a promoter or any other genetic elements necessary for the expression of the polypeptide by the target tissue. Such gene therapy and delivery techniques and methods are known in the art, see, for example, WO90/11092, WO98/11779; U.S. Patent NO. 5693622, 5705151, 5580859; Tabata et al., Cardiovasc. Res. 35(3):470-479 (1997); Chao et al., Pharmacol. Res. 35(6):517-522 (1997); Wolff, Neuromuscul. Disord. 7(5):314-318 (1997); Schwartz et al., Gene Ther. 3(5):405-411 (1996); Tsurumi et al., Circulation 94(12):3281-3290 (1996) (incorporated herein by reference).

The polynucleotide constructs may be delivered by any method that delivers injectable materials to the cells of an animal, such as, injection into the interstitial space of tissues (heart, muscle, skin, lung, liver, intestine and the like). The polynucleotide constructs can be delivered in a pharmaceutically acceptable liquid or aqueous carrier.

The term "naked" polynucleotide, DNA or RNA, refers to sequences that are free from any delivery vehicle that acts to assist, promote, or facilitate entry into the cell, including viral sequences, viral particles, liposome formulations, lipofectin or precipitating agents and the like. However, the polynucleotides of the present invention may also be delivered in liposome formulations (such as those taught in Felgner P.L. et al. (1995) Ann. NY Acad. Sci. 772:126-139 and Abdallah B. et al. (1995) Biol. Cell 85(1):1-7) which can be prepared by methods well known to those skilled in the art.

The polynucleotide vector constructs used in the gene therapy method are preferably constructs that will not integrate into the host genome nor will they contain sequences that

allow for replication. Any strong promoter known to those skilled in the art can be used for driving the expression of DNA. Unlike other gene therapies techniques, one major advantage of introducing naked nucleic acid sequences into target cells is the transitory nature of the polynucleotide synthesis in the cells. Studies have shown that non-replicating DNA sequences can be introduced into cells to provide production of the desired polypeptide for periods of up to six months.

The polynucleotide construct can be delivered to the interstitial space of tissues within the an animal, including of muscle, skin, brain, lung, liver, spleen, bone marrow, thymus, heart, lymph, blood, bone, cartilage, pancreas, kidney, gall bladder, stomach, intestine, testis, ovary, uterus, rectum, nervous system, eye, gland, and connective tissue. Interstitial space of the tissues comprises the intercellular fluid, mucopolysaccharide matrix among the reticular fibers of organ tissues, elastic fibers in the walls of vessels or chambers, collagen fibers of fibrous tissues, or that same matrix within connective tissue ensheathing muscle cells or in the lacunae of bone. It is similarly the space occupied by the plasma of the circulation and the lymph fluid of the lymphatic channels. Delivery to the interstitial space of muscle tissue is preferred for the reasons discussed below. They may be conveniently delivered by injection into the tissues comprising these cells. They are preferably delivered to and expressed in persistent, non-dividing cells which are differentiated, although delivery and expression may be achieved in non-differentiated or less completely differentiated cells, such as, for example, stem cells of blood or skin fibroblasts. *In vivo* muscle cells are particularly competent in their ability to take up and express polynucleotides.

For the naked polynucleotide injection, an effective dosage amount of DNA or RNA will be in the range of from about 0.05 g/kg body weight to about 50 mg/kg body weight. Preferably the dosage will be from about 0.005 mg/kg to about 20 mg/kg and more preferably from about 0.05 mg/kg to about 5 mg/kg. Of course, as the artisan of ordinary skill will appreciate, this dosage will vary according to the tissue site of injection. The appropriate and effective dosage of nucleic acid sequence can readily be determined by those of ordinary skill in the art and may depend on the condition being treated and the route of administration. The preferred route of administration is by the parenteral route of injection into the interstitial space of tissues. However, other parenteral routes may also be used, such as, inhalation of an aerosol formulation particularly for delivery to lungs or bronchial tissues, throat or mucous membranes of the nose. In addition, naked polynucleotide constructs can be delivered to

arteries during angioplasty by the catheter used in the procedure.

The dose response effects of injected polynucleotide in muscle *in vivo* is determined as follows. Suitable template DNA for production of mRNA coding for polypeptide of the present invention is prepared in accordance with a standard recombinant DNA methodology.

5 The template DNA, which may be either circular or linear, is either used as naked DNA or complexed with liposomes. The quadriceps muscles of mice are then injected with various amounts of the template DNA.

10 Five to six week old female and male Balb/C mice are anesthetized by intraperitoneal injection with 0.3 ml of 2.5% Avertin. A 1.5 cm incision is made on the anterior thigh, and the quadriceps muscle is directly visualized. The template DNA is injected in 0.1 ml of carrier in a 1 cc syringe through a 27 gauge needle over one minute, approximately 0.5 cm from the distal insertion site of the muscle into the knee and about 0.2 cm deep. A suture is placed over the injection site for future localization, and the skin is closed with stainless steel clips.

15 After an appropriate incubation time (e.g., 7 days) muscle extracts are prepared by excising the entire quadriceps. Every fifth 15 um cross-section of the individual quadriceps muscles is histochemically stained for protein expression. A time course for protein expression may be done in a similar fashion except that quadriceps from different mice are harvested at different times. Persistence of DNA in muscle following injection may be
20 determined by Southern blot analysis after preparing total cellular DNA and HIRT supernatants from injected and control mice. The results of the above experimentation in mice can be use to extrapolate proper dosages and other treatment parameters in humans and other animals using naked DNA.

25 *Example 19: Transgenic Animals*

The polypeptides of the invention can also be expressed in transgenic animals. Animals of any species, including, but not limited to, mice, rats, rabbits, hamsters, guinea pigs, pigs, micro-pigs, goats, sheep, cows and non-human primates, e.g., baboons, monkeys,
30 and chimpanzees may be used to generate transgenic animals. In a specific embodiment, techniques described herein or otherwise known in the art, are used to express polypeptides of the invention in humans, as part of a gene therapy protocol.

Any technique known in the art may be used to introduce the transgene (i.e., polynucleotides of the invention) into animals to produce the founder lines of transgenic animals. Such techniques include, but are not limited to, pronuclear microinjection (Paterson et al., Appl. Microbiol. Biotechnol. 40:691-698 (1994); Carver et al., Biotechnology (NY) 11:1263-1270 (1993); Wright et al., Biotechnology (NY) 9:830-834 (1991); and Hoppe et al., U.S. Pat. No. 4,873,191 (1989)); retrovirus mediated gene transfer into germ lines (Van der Putten et al., Proc. Natl. Acad. Sci., USA 82:6148-6152 (1985)), blastocysts or embryos; gene targeting in embryonic stem cells (Thompson et al., Cell 56:313-321 (1989)); electroporation of cells or embryos (Lo, 1983, Mol Cell. Biol. 3:1803-1814 (1983)); introduction of the polynucleotides of the invention using a gene gun (see, e.g., Ulmer et al., Science 259:1745 (1993); introducing nucleic acid constructs into embryonic pluripotent stem cells and transferring the stem cells back into the blastocyst; and sperm-mediated gene transfer (Lavitrano et al., Cell 57:717-723 (1989); etc. For a review of such techniques, see Gordon, "Transgenic Animals," Intl. Rev. Cytol. 115:171-229 (1989), which is incorporated by reference herein in its entirety.

Any technique known in the art may be used to produce transgenic clones containing polynucleotides of the invention, for example, nuclear transfer into enucleated oocytes of nuclei from cultured embryonic, fetal, or adult cells induced to quiescence (Campell et al., Nature 380:64-66 (1996); Wilmut et al., Nature 385:810-813 (1997)).

The present invention provides for transgenic animals that carry the transgene in all their cells, as well as animals which carry the transgene in some, but not all their cells, i.e., mosaic animals or chimeric. The transgene may be integrated as a single transgene or as multiple copies such as in concatamers, e.g., head-to-head tandems or head-to-tail tandems. The transgene may also be selectively introduced into and activated in a particular cell type by following, for example, the teaching of Lasko et al. (Lasko et al., Proc. Natl. Acad. Sci. USA 89:6232-6236 (1992)). The regulatory sequences required for such a cell-type specific activation will depend upon the particular cell type of interest, and will be apparent to those of skill in the art. When it is desired that the polynucleotide transgene be integrated into the chromosomal site of the endogenous gene, gene targeting is preferred. Briefly, when such a technique is to be utilized, vectors containing some nucleotide sequences homologous to the endogenous gene are designed for the purpose of integrating, via homologous recombination with chromosomal sequences, into and disrupting the function of the nucleotide sequence of

the endogenous gene. The transgene may also be selectively introduced into a particular cell type, thus inactivating the endogenous gene in only that cell type, by following, for example, the teaching of Gu et al. (Gu et al., Science 265:103-106 (1994)). The regulatory sequences required for such a cell-type specific inactivation will depend upon the particular cell type of interest, and will be apparent to those of skill in the art.

Once transgenic animals have been generated, the expression of the recombinant gene may be assayed utilizing standard techniques. Initial screening may be accomplished by Southern blot analysis or PCR techniques to analyze animal tissues to verify that integration of the transgene has taken place. The level of mRNA expression of the transgene in the tissues of the transgenic animals may also be assessed using techniques which include, but are not limited to, Northern blot analysis of tissue samples obtained from the animal, *in situ* hybridization analysis, and reverse transcriptase-PCR (rt-PCR). Samples of transgenic gene-expressing tissue may also be evaluated immunocytochemically or immunohistochemically using antibodies specific for the transgene product.

Once the founder animals are produced, they may be bred, inbred, outbred, or crossbred to produce colonies of the particular animal. Examples of such breeding strategies include, but are not limited to: outbreeding of founder animals with more than one integration site in order to establish separate lines; inbreeding of separate lines in order to produce compound transgenics that express the transgene at higher levels because of the effects of additive expression of each transgene; crossing of heterozygous transgenic animals to produce animals homozygous for a given integration site in order to both augment expression and eliminate the need for screening of animals by DNA analysis; crossing of separate homozygous lines to produce compound heterozygous or homozygous lines; and breeding to place the transgene on a distinct background that is appropriate for an experimental model of interest.

Transgenic animals of the invention have uses which include, but are not limited to, animal model systems useful in elaborating the biological function of polypeptides of the present invention, studying conditions and/or disorders associated with aberrant expression, and in screening for compounds effective in ameliorating such conditions and/or disorders.

Example 20: Knock-Out Animals

Endogenous gene expression can also be reduced by inactivating or "knocking out" the gene and/or its promoter using targeted homologous recombination. (E.g., see Smithies et al., Nature 317:230-234 (1985); Thomas & Capecchi, Cell 51:503-512 (1987); Thompson et al., Cell 5:313-321 (1989); each of which is incorporated by reference herein in its entirety). For example, a mutant, non-functional polynucleotide of the invention (or a completely unrelated DNA sequence) flanked by DNA homologous to the endogenous polynucleotide sequence (either the coding regions or regulatory regions of the gene) can be used, with or without a selectable marker and/or a negative selectable marker, to transfect cells that express polypeptides of the invention *in vivo*. In another embodiment, techniques known in the art are used to generate knockouts in cells that contain, but do not express the gene of interest. Insertion of the DNA construct, via targeted homologous recombination, results in inactivation of the targeted gene. Such approaches are particularly suited in research and agricultural fields where modifications to embryonic stem cells can be used to generate animal offspring with an inactive targeted gene (e.g., see Thomas & Capecchi 1987 and Thompson 1989, *supra*). However this approach can be routinely adapted for use in humans provided the recombinant DNA constructs are directly administered or targeted to the required site *in vivo* using appropriate viral vectors that will be apparent to those of skill in the art.

In further embodiments of the invention, cells that are genetically engineered to express the polypeptides of the invention, or alternatively, that are genetically engineered not to express the polypeptides of the invention (e.g., knockouts) are administered to a patient *in vivo*. Such cells may be obtained from the patient (i.e., animal, including human) or an MHC compatible donor and can include, but are not limited to fibroblasts, bone marrow cells, blood cells (e.g., lymphocytes), adipocytes, muscle cells, endothelial cells etc. The cells are genetically engineered *in vitro* using recombinant DNA techniques to introduce the coding sequence of polypeptides of the invention into the cells, or alternatively, to disrupt the coding sequence and/or endogenous regulatory sequence associated with the polypeptides of the invention, e.g., by transduction (using viral vectors, and preferably vectors that integrate the transgene into the cell genome) or transfection procedures, including, but not limited to, the use of plasmids, cosmids, YACs, naked DNA, electroporation, liposomes, etc. The coding sequence of the polypeptides of the invention can be placed under the control of a strong constitutive or inducible promoter or promoter/enhancer to achieve expression, and

preferably secretion, of the polypeptides of the invention. The engineered cells which express and preferably secrete the polypeptides of the invention can be introduced into the patient systemically, e.g., in the circulation, or intraperitoneally.

Alternatively, the cells can be incorporated into a matrix and implanted in the body, e.g., genetically engineered fibroblasts can be implanted as part of a skin graft; genetically engineered endothelial cells can be implanted as part of a lymphatic or vascular graft. (See, for example, Anderson et al. U.S. Patent No. 5,399,349; and Mulligan & Wilson, U.S. Patent No. 5,460,959 each of which is incorporated by reference herein in its entirety).

When the cells to be administered are non-autologous or non-MHC compatible cells, they can be administered using well known techniques which prevent the development of a host immune response against the introduced cells. For example, the cells may be introduced in an encapsulated form which, while allowing for an exchange of components with the immediate extracellular environment, does not allow the introduced cells to be recognized by the host immune system.

Transgenic and "knock-out" animals of the invention have uses which include, but are not limited to, animal model systems useful in elaborating the biological function of polypeptides of the present invention, studying conditions and/or disorders associated with aberrant expression, and in screening for compounds effective in ameliorating such conditions and/or disorders.

Example 22: Assays Detecting Stimulation or Inhibition of B cell Proliferation and Differentiation

Generation of functional humoral immune responses requires both soluble and cognate signaling between B-lineage cells and their microenvironment. Signals may impart a positive stimulus that allows a B-lineage cell to continue its programmed development, or a negative stimulus that instructs the cell to arrest its current developmental pathway. To date, numerous stimulatory and inhibitory signals have been found to influence B cell responsiveness including IL-2, IL-4, IL-5, IL-6, IL-7, IL10, IL-13, IL-14 and IL-15. Interestingly, these signals are by themselves weak effectors but can, in combination with various co-stimulatory proteins, induce activation, proliferation, differentiation, homing, tolerance and death among B cell populations.

One of the best studied classes of B-cell co-stimulatory proteins is the TNF-superfamily. Within this family CD40, CD27, and CD30 along with their respective ligands CD154, CD70, and CD153 have been found to regulate a variety of immune responses. Assays which allow for the detection and/or observation of the proliferation and differentiation of these B-cell populations and their precursors are valuable tools in determining the effects various proteins may have on these B-cell populations in terms of proliferation and differentiation. Listed below are two assays designed to allow for the detection of the differentiation, proliferation, or inhibition of B-cell populations and their precursors.

In Vitro Assay- Agonists or antagonists of the invention can be assessed for its ability to induce activation, proliferation, differentiation or inhibition and/or death in B-cell populations and their precursors. The activity of the agonists or antagonists of the invention on purified human tonsillar B cells, measured qualitatively over the dose range from 0.1 to 10,000 ng/mL, is assessed in a standard B-lymphocyte co-stimulation assay in which purified tonsillar B cells are cultured in the presence of either formalin-fixed *Staphylococcus aureus* Cowan I (SAC) or immobilized anti-human IgM antibody as the priming agent. Second signals such as IL-2 and IL-15 synergize with SAC and IgM crosslinking to elicit B cell proliferation as measured by tritiated-thymidine incorporation. Novel synergizing agents can be readily identified using this assay. The assay involves isolating human tonsillar B cells by magnetic bead (MACS) depletion of CD3-positive cells. The resulting cell population is greater than 95% B cells as assessed by expression of CD45R(B220).

Various dilutions of each sample are placed into individual wells of a 96-well plate to which are added 10^5 B-cells suspended in culture medium (RPMI 1640 containing 10% FBS, 5×10^{-5} M 2ME, 100U/ml penicillin, 10ug/ml streptomycin, and 10^{-5} dilution of SAC) in a total volume of 150ul. Proliferation or inhibition is quantitated by a 20h pulse (1uCi/well) with 3 H-thymidine (6.7 Ci/mM) beginning 72h post factor addition. The positive and negative controls are IL2 and medium respectively.

In Vivo Assay- BALB/c mice are injected (i.p.) twice per day with buffer only, or 2 mg/Kg of agonists or antagonists of the invention, or truncated forms thereof. Mice receive this treatment for 4 consecutive days, at which time they are sacrificed and various tissues and serum collected for analyses. Comparison of H&E sections from normal spleens and spleens treated with agonists or antagonists of the invention identify the results of the activity

of the agonists or antagonists on spleen cells, such as the diffusion of peri-arterial lymphatic sheaths, and/or significant increases in the nucleated cellularity of the red pulp regions, which may indicate the activation of the differentiation and proliferation of B-cell populations. Immunohistochemical studies using a B cell marker, anti-CD45R(B220), are used to determine whether any physiological changes to splenic cells, such as splenic disorganization, are due to increased B-cell representation within loosely defined B-cell zones that infiltrate established T-cell regions.

Flow cytometric analyses of the spleens from mice treated with agonist or antagonist is used to indicate whether the agonists or antagonists specifically increases the proportion of ThB+, CD45R(B220)dull B cells over that which is observed in control mice.

Likewise, a predicted consequence of increased mature B-cell representation in vivo is a relative increase in serum Ig titers. Accordingly, serum IgM and IgA levels are compared between buffer and agonists or antagonists-treated mice.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 23: T Cell Proliferation Assay

A CD3-induced proliferation assay is performed on PBMCs and is measured by the uptake of ^3H -thymidine. The assay is performed as follows. Ninety-six well plates are coated with 100 μl /well of mAb to CD3 (HIT3a, Pharmingen) or isotype-matched control mAb (B33.1) overnight at 4 degrees C (1 $\mu\text{g}/\text{ml}$ in .05M bicarbonate buffer, pH 9.5), then washed three times with PBS. PBMC are isolated by F/H gradient centrifugation from human peripheral blood and added to quadruplicate wells (5×10^4 /well) of mAb coated plates in RPMI containing 10% FCS and P/S in the presence of varying concentrations of agonists or antagonists of the invention (total volume 200 μl). Relevant protein buffer and medium alone are controls. After 48 hr. culture at 37 degrees C, plates are spun for 2 min. at 1000 rpm and 100 μl of supernatant is removed and stored -20 degrees C for measurement of IL-2 (or other cytokines) if effect on proliferation is observed. Wells are supplemented with 100 μl of medium containing 0.5 uCi of ^3H -thymidine and cultured at 37 degrees C for 18-24 hr. Wells are harvested and incorporation of ^3H -thymidine used as a measure of proliferation.

Anti-CD3 alone is the positive control for proliferation. IL-2 (100 U/ml) is also used as a control which enhances proliferation. Control antibody which does not induce proliferation of T cells is used as the negative controls for the effects of agonists or antagonists of the invention.

- 5 The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

10 *Example 24: Effect of Agonists or Antagonists of the Invention on the Expression of MHC Class II, Costimulatory and Adhesion Molecules and Cell Differentiation of Monocytes and Monocyte-Derived Human Dendritic Cells*

Dendritic cells are generated by the expansion of proliferating precursors found in the peripheral blood: adherent PBMC or elutriated monocytic fractions are cultured for 7-10 days
15 with GM-CSF (50 ng/ml) and IL-4 (20 ng/ml). These dendritic cells have the characteristic phenotype of immature cells (expression of CD1, CD80, CD86, CD40 and MHC class II antigens). Treatment with activating factors, such as TNF- α , causes a rapid change in surface phenotype (increased expression of MHC class I and II, costimulatory and adhesion molecules, downregulation of FC γ RII, upregulation of CD83). These changes correlate with
20 increased antigen-presenting capacity and with functional maturation of the dendritic cells.

FACS analysis of surface antigens is performed as follows. Cells are treated 1-3 days with increasing concentrations of agonist or antagonist of the invention or LPS (positive control), washed with PBS containing 1% BSA and 0.02 mM sodium azide, and then incubated with 1:20 dilution of appropriate FITC- or PE-labeled monoclonal antibodies for
25 30 minutes at 4 degrees C. After an additional wash, the labeled cells are analyzed by flow cytometry on a FACScan (Becton Dickinson).

Effect on the production of cytokines. Cytokines generated by dendritic cells, in particular IL-12, are important in the initiation of T-cell dependent immune responses. IL-12 strongly
30 influences the development of Th1 helper T-cell immune response, and induces cytotoxic T and NK cell function. An ELISA is used to measure the IL-12 release as follows. Dendritic cells (10^6 /ml) are treated with increasing concentrations of agonists or antagonists of the

invention for 24 hours. LPS (100 ng/ml) is added to the cell culture as positive control. Supernatants from the cell cultures are then collected and analyzed for IL-12 content using commercial ELISA kit (e.g., R & D Systems (Minneapolis, MN)). The standard protocols provided with the kits are used.

5

Effect on the expression of MHC Class II, costimulatory and adhesion molecules. Three major families of cell surface antigens can be identified on monocytes: adhesion molecules, molecules involved in antigen presentation, and Fc receptor. Modulation of the expression of MHC class II antigens and other costimulatory molecules, such as B7 and ICAM-1, may result in changes in the antigen presenting capacity of monocytes and ability to induce T cell activation. Increase expression of Fc receptors may correlate with improved monocyte cytotoxic activity, cytokine release and phagocytosis.

10

FACS analysis is used to examine the surface antigens as follows. Monocytes are treated 1-5 days with increasing concentrations of agonists or antagonists of the invention or LPS (positive control), washed with PBS containing 1% BSA and 0.02 mM sodium azide, and then incubated with 1:20 dilution of appropriate FITC- or PE-labeled monoclonal antibodies for 30 minutes at 4 degreesC. After an additional wash, the labeled cells are analyzed by flow cytometry on a FACScan (Becton Dickinson).

15

Monocyte activation and/or increased survival. Assays for molecules that activate (or alternatively, inactivate) monocytes and/or increase monocyte survival (or alternatively, decrease monocyte survival) are known in the art and may routinely be applied to determine whether a molecule of the invention functions as an inhibitor or activator of monocytes. Agonists or antagonists of the invention can be screened using the three assays described below. For each of these assays, Peripheral blood mononuclear cells (PBMC) are purified from single donor leukopacks (American Red Cross, Baltimore, MD) by centrifugation through a Histopaque gradient (Sigma). Monocytes are isolated from PBMC by counterflow centrifugal elutriation.

25

Monocyte Survival Assay. Human peripheral blood monocytes progressively lose viability when cultured in absence of serum or other stimuli. Their death results from internally regulated process (apoptosis). Addition to the culture of activating factors, such as TNF-alpha

30

dramatically improves cell survival and prevents DNA fragmentation. Propidium iodide (PI) staining is used to measure apoptosis as follows. Monocytes are cultured for 48 hours in polypropylene tubes in serum-free medium (positive control), in the presence of 100 ng/ml TNF-alpha (negative control), and in the presence of varying concentrations of the compound to be tested. Cells are suspended at a concentration of 2×10^6 /ml in PBS containing PI at a final concentration of 5 µg/ml, and then incubated at room temperature for 5 minutes before FACScan analysis. PI uptake has been demonstrated to correlate with DNA fragmentation in this experimental paradigm.

- 10 Effect on cytokine release. An important function of monocytes/macrophages is their regulatory activity on other cellular populations of the immune system through the release of cytokines after stimulation. An ELISA to measure cytokine release is performed as follows. Human monocytes are incubated at a density of 5×10^5 cells/ml with increasing concentrations of agonists or antagonists of the invention and under the same conditions, but in the absence of agonists or antagonists. For IL-12 production, the cells are primed overnight with IFN (100 U/ml) in presence of agonist or antagonist of the invention. LPS (10 ng/ml) is then added. Conditioned media are collected after 24h and kept frozen until use. Measurement of TNF-alpha, IL-10, MCP-1 and IL-8 is then performed using a commercially available ELISA kit (e. g, R & D Systems (Minneapolis, MN)) and applying the standard protocols provided with the kit.

- 25 Oxidative burst. Purified monocytes are plated in 96-w plate at 2×10^5 cell/well. Increasing concentrations of agonists or antagonists of the invention are added to the wells in a total volume of 0.2 ml culture medium (RPMI 1640 + 10% FCS, glutamine and antibiotics). After 3 days incubation, the plates are centrifuged and the medium is removed from the wells. To the macrophage monolayers, 0.2 ml per well of phenol red solution (140 mM NaCl, 10 mM potassium phosphate buffer pH 7.0, 5.5 mM dextrose, 0.56 mM phenol red and 19 U/ml of HRPO) is added, together with the stimulant (200 nM PMA). The plates are incubated at 37°C for 2 hours and the reaction is stopped by adding 20 µl 1N NaOH per well. The absorbance is read at 610 nm. To calculate the amount of H_2O_2 produced by the macrophages, a standard curve of a H_2O_2 solution of known molarity is performed for each experiment.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

5

Example 25: Biological Effects of Agonists or Antagonists of the Invention

Astrocyte and Neuronal Assays.

Agonists or antagonists of the invention, expressed in *Escherichia coli* and purified
10 as described above, can be tested for activity in promoting the survival, neurite outgrowth, or phenotypic differentiation of cortical neuronal cells and for inducing the proliferation of glial fibrillary acidic protein immunopositive cells, astrocytes. The selection of cortical cells for the bioassay is based on the prevalent expression of FGF-1 and FGF-2 in cortical structures and on the previously reported enhancement of cortical neuronal survival resulting from
15 FGF-2 treatment. A thymidine incorporation assay, for example, can be used to elucidate an agonist or antagonist of the invention's activity on these cells.

Moreover, previous reports describing the biological effects of FGF-2 (basic FGF) on cortical or hippocampal neurons *in vitro* have demonstrated increases in both neuron survival and neurite outgrowth (Walicke et al., "Fibroblast growth factor promotes survival of
20 dissociated hippocampal neurons and enhances neurite extension." *Proc. Natl. Acad. Sci. USA* 83:3012-3016. (1986), assay herein incorporated by reference in its entirety). However, reports from experiments done on PC-12 cells suggest that these two responses are not necessarily synonymous and may depend on not only which FGF is being tested but also on which receptor(s) are expressed on the target cells. Using the primary cortical neuronal
25 culture paradigm, the ability of an agonist or antagonist of the invention to induce neurite outgrowth can be compared to the response achieved with FGF-2 using, for example, a thymidine incorporation assay.

Fibroblast and endothelial cell assays.

30 Human lung fibroblasts are obtained from Clonetics (San Diego, CA) and maintained in growth media from Clonetics. Dermal microvascular endothelial cells are obtained from

Cell Applications (San Diego, CA). For proliferation assays, the human lung fibroblasts and dermal microvascular endothelial cells can be cultured at 5,000 cells/well in a 96-well plate for one day in growth medium. The cells are then incubated for one day in 0.1% BSA basal medium. After replacing the medium with fresh 0.1% BSA medium, the cells are incubated with the test proteins for 3 days. Alamar Blue (Alamar Biosciences, Sacramento, CA) is added to each well to a final concentration of 10%. The cells are incubated for 4 hr. Cell viability is measured by reading in a CytoFluor fluorescence reader. For the PGE₂ assays, the human lung fibroblasts are cultured at 5,000 cells/well in a 96-well plate for one day. After a medium change to 0.1% BSA basal medium, the cells are incubated with FGF-2 or agonists or antagonists of the invention with or without IL-1 α for 24 hours. The supernatants are collected and assayed for PGE₂ by EIA kit (Cayman, Ann Arbor, MI). For the IL-6 assays, the human lung fibroblasts are cultured at 5,000 cells/well in a 96-well plate for one day. After a medium change to 0.1% BSA basal medium, the cells are incubated with FGF-2 or with or without agonists or antagonists of the invention IL-1 α for 24 hours. The supernatants are collected and assayed for IL-6 by ELISA kit (Endogen, Cambridge, MA).

Human lung fibroblasts are cultured with FGF-2 or agonists or antagonists of the invention for 3 days in basal medium before the addition of Alamar Blue to assess effects on growth of the fibroblasts. FGF-2 should show a stimulation at 10 - 2500 ng/ml which can be used to compare stimulation with agonists or antagonists of the invention.

Parkinson Models.

The loss of motor function in Parkinson's disease is attributed to a deficiency of striatal dopamine resulting from the degeneration of the nigrostriatal dopaminergic projection neurons. An animal model for Parkinson's that has been extensively characterized involves the systemic administration of 1-methyl-4 phenyl 1,2,3,6-tetrahydropyridine (MPTP). In the CNS, MPTP is taken-up by astrocytes and catabolized by monoamine oxidase B to 1-methyl-4-phenyl pyridine (MPP⁺) and released. Subsequently, MPP⁺ is actively accumulated in dopaminergic neurons by the high-affinity reuptake transporter for dopamine. MPP⁺ is then concentrated in mitochondria by the electrochemical gradient and selectively inhibits nicotinamide adenine disphosphate: ubiquinone oxidoreductionase (complex I), thereby interfering with electron transport and eventually generating oxygen radicals.

It has been demonstrated in tissue culture paradigms that FGF-2 (basic FGF) has trophic activity towards nigral dopaminergic neurons (Ferrari et al., Dev. Biol. 1989). Recently, Dr. Unsicker's group has demonstrated that administering FGF-2 in gel foam implants in the striatum results in the near complete protection of nigral dopaminergic neurons from the toxicity associated with MPTP exposure (Otto and Unsicker, J. Neuroscience, 1990).

Based on the data with FGF-2, agonists or antagonists of the invention can be evaluated to determine whether it has an action similar to that of FGF-2 in enhancing dopaminergic neuronal survival *in vitro* and it can also be tested *in vivo* for protection of dopaminergic neurons in the striatum from the damage associated with MPTP treatment. The potential effect of an agonist or antagonist of the invention is first examined *in vitro* in a dopaminergic neuronal cell culture paradigm. The cultures are prepared by dissecting the midbrain floor plate from gestation day 14 Wistar rat embryos. The tissue is dissociated with trypsin and seeded at a density of 200,000 cells/cm² on polyorthinine-laminin coated glass coverslips. The cells are maintained in Dulbecco's Modified Eagle's medium and F12 medium containing hormonal supplements (N1). The cultures are fixed with paraformaldehyde after 8 days *in vitro* and are processed for tyrosine hydroxylase, a specific marker for dopaminergic neurons, immunohistochemical staining. Dissociated cell cultures are prepared from embryonic rats. The culture medium is changed every third day and the factors are also added at that time.

Since the dopaminergic neurons are isolated from animals at gestation day 14, a developmental time which is past the stage when the dopaminergic precursor cells are proliferating, an increase in the number of tyrosine hydroxylase immunopositive neurons would represent an increase in the number of dopaminergic neurons surviving *in vitro*. Therefore, if an agonist or antagonist of the invention acts to prolong the survival of dopaminergic neurons, it would suggest that the agonist or antagonist may be involved in Parkinson's Disease.

The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 26: The Effect of Agonists or Antagonists of the Invention on the Growth of Vascular Endothelial Cells

On day 1, human umbilical vein endothelial cells (HUVEC) are seeded at $2-5 \times 10^4$ cells/35 mm dish density in M199 medium containing 4% fetal bovine serum (FBS), 16 units/ml heparin, and 50 units/ml endothelial cell growth supplements (ECGS, Biotechnology, Inc.). On day 2, the medium is replaced with M199 containing 10% FBS, 8 units/ml heparin. An agonist or antagonist of the invention, and positive controls, such as VEGF and basic FGF (bFGF) are added, at varying concentrations. On days 4 and 6, the medium is replaced. On day 8, cell number is determined with a Coulter Counter.

An increase in the number of HUVEC cells indicates that the compound of the invention may proliferate vascular endothelial cells, while a decrease in the number of HUVEC cell indicates that the compound of the invention inhibits vascular endothelial cells.

The studies described in this example tested activity of a polypeptide of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), agonists, and/or antagonists of the invention.

Example 27: Rat Corneal Wound Healing Model

This animal model shows the effect of an agonist or antagonist of the invention on neovascularization. The experimental protocol includes:

a) Making a 1-1.5 mm long incision from the center of cornea into the stromal layer.

b) Inserting a spatula below the lip of the incision facing the outer corner of the eye.

c) Making a pocket (its base is 1-1.5 mm from the edge of the eye).

d) Positioning a pellet, containing 50ng- 5ug of an agonist or antagonist of the invention, within the pocket.

e) Treatment with an agonist or antagonist of the invention can also be applied topically to the corneal wounds in a dosage range of 20mg - 500mg (daily treatment for five days).

The studies described in this example tested activity of agonists or antagonists of the

invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 28: Diabetic Mouse and Glucocorticoid-Impaired Wound Healing Models

5

A. Diabetic db+/db+ Mouse Model.

To demonstrate that an agonist or antagonist of the invention accelerates the healing process, the genetically diabetic mouse model of wound healing is used. The full thickness wound healing model in the db+/db+ mouse is a well characterized, clinically relevant and reproducible model of impaired wound healing. Healing of the diabetic wound is dependent on formation of granulation tissue and re-epithelialization rather than contraction (Gartner, M.H. *et al.*, *J. Surg. Res.* 52:389 (1992); Greenhalgh, D.G. *et al.*, *Am. J. Pathol.* 136:1235 (1990)).

The diabetic animals have many of the characteristic features observed in Type II diabetes mellitus. Homozygous (db+/db+) mice are obese in comparison to their normal heterozygous (db+/+m) littermates. Mutant diabetic (db+/db+) mice have a single autosomal recessive mutation on chromosome 4 (db+) (Coleman *et al.* *Proc. Natl. Acad. Sci. USA* 77:283-293 (1982)). Animals show polyphagia, polydipsia and polyuria. Mutant diabetic mice (db+/db+) have elevated blood glucose, increased or normal insulin levels, and suppressed cell-mediated immunity (Mandel *et al.*, *J. Immunol.* 120:1375 (1978); Debray-Sachs, M. *et al.*, *Clin. Exp. Immunol.* 51(1):1-7 (1983); Leiter *et al.*, *Am. J. of Pathol.* 114:46-55 (1985)). Peripheral neuropathy, myocardial complications, and microvascular lesions, basement membrane thickening and glomerular filtration abnormalities have been described in these animals (Norido, F. *et al.*, *Exp. Neurol.* 83(2):221-232 (1984); Robertson *et al.*, *Diabetes* 29(1):60-67 (1980); Giacomelli *et al.*, *Lab Invest.* 40(4):460-473 (1979); Coleman, D.L., *Diabetes* 31 (Suppl):1-6 (1982)). These homozygous diabetic mice develop hyperglycemia that is resistant to insulin analogous to human type II diabetes (Mandel *et al.*, *J. Immunol.* 120:1375-1377 (1978)).

The characteristics observed in these animals suggests that healing in this model may be similar to the healing observed in human diabetes (Greenhalgh, *et al.*, *Am. J. of Pathol.* 136:1235-1246 (1990)).

Genetically diabetic female C57BL/KsJ (db+/db+) mice and their non-diabetic

(db+/+m) heterozygous littermates are used in this study (Jackson Laboratories). The animals are purchased at 6 weeks of age and are 8 weeks old at the beginning of the study. Animals are individually housed and received food and water ad libitum. All manipulations are performed using aseptic techniques. The experiments are conducted according to the rules and guidelines of Human Genome Sciences, Inc. Institutional Animal Care and Use Committee and the Guidelines for the Care and Use of Laboratory Animals.

Wounding protocol is performed according to previously reported methods (Tsuboi, R. and Rifkin, D.B., *J. Exp. Med.* 172:245-251 (1990)). Briefly, on the day of wounding, animals are anesthetized with an intraperitoneal injection of Avertin (0.01 mg/mL), 2,2,2-tribromoethanol and 2-methyl-2-butanol dissolved in deionized water. The dorsal region of the animal is shaved and the skin washed with 70% ethanol solution and iodine. The surgical area is dried with sterile gauze prior to wounding. An 8 mm full-thickness wound is then created using a Keyes tissue punch. Immediately following wounding, the surrounding skin is gently stretched to eliminate wound expansion. The wounds are left open for the duration of the experiment. Application of the treatment is given topically for 5 consecutive days commencing on the day of wounding. Prior to treatment, wounds are gently cleansed with sterile saline and gauze sponges.

Wounds are visually examined and photographed at a fixed distance at the day of surgery and at two day intervals thereafter. Wound closure is determined by daily measurement on days 1-5 and on day 8. Wounds are measured horizontally and vertically using a calibrated Jameson caliper. Wounds are considered healed if granulation tissue is no longer visible and the wound is covered by a continuous epithelium.

An agonist or antagonist of the invention is administered using at a range different doses, from 4mg to 500mg per wound per day for 8 days in vehicle. Vehicle control groups received 50mL of vehicle solution.

Animals are euthanized on day 8 with an intraperitoneal injection of sodium pentobarbital (300mg/kg). The wounds and surrounding skin are then harvested for histology and immunohistochemistry. Tissue specimens are placed in 10% neutral buffered formalin in tissue cassettes between biopsy sponges for further processing.

Three groups of 10 animals each (5 diabetic and 5 non-diabetic controls) are evaluated: 1) Vehicle placebo control, 2) untreated group, and 3) treated group.

Wound closure is analyzed by measuring the area in the vertical and horizontal axis and

obtaining the total square area of the wound. Contraction is then estimated by establishing the differences between the initial wound area (day 0) and that of post treatment (day 8). The wound area on day 1 is 64mm², the corresponding size of the dermal punch. Calculations are made using the following formula:

5

$$[\text{Open area on day 8}] - [\text{Open area on day 1}] / [\text{Open area on day 1}]$$

Specimens are fixed in 10% buffered formalin and paraffin embedded blocks are sectioned perpendicular to the wound surface (5mm) and cut using a Reichert-Jung microtome.

10 Routine hematoxylin-eosin (H&E) staining is performed on cross-sections of bisected wounds. Histologic examination of the wounds are used to assess whether the healing process and the morphologic appearance of the repaired skin is altered by treatment with an agonist or antagonist of the invention. This assessment included verification of the presence of cell accumulation, inflammatory cells, capillaries, fibroblasts, re-epithelialization and
15 epidermal maturity (Greenhalgh, D.G. *et al.*, *Am. J. Pathol.* 136:1235 (1990)). A calibrated lens micrometer is used by a blinded observer.

Tissue sections are also stained immunohistochemically with a polyclonal rabbit anti-human keratin antibody using ABC Elite detection system. Human skin is used as a positive tissue control while non-immune IgG is used as a negative control. Keratinocyte growth is
20 determined by evaluating the extent of reepithelialization of the wound using a calibrated lens micrometer.

Proliferating cell nuclear antigen/cyclin (PCNA) in skin specimens is demonstrated by using anti-PCNA antibody (1:50) with an ABC Elite detection system. Human colon cancer served as a positive tissue control and human brain tissue is used as a negative tissue
25 control. Each specimen included a section with omission of the primary antibody and substitution with non-immune mouse IgG. Ranking of these sections is based on the extent of proliferation on a scale of 0-8, the lower side of the scale reflecting slight proliferation to the higher side reflecting intense proliferation.

Experimental data are analyzed using an unpaired t test. A p value of < 0.05 is
30 considered significant.

B. Steroid Impaired Rat Model

The inhibition of wound healing by steroids has been well documented in various *in vitro* and *in vivo* systems (Wahl, Glucocorticoids and Wound healing. In: Anti-Inflammatory Steroid Action: Basic and Clinical Aspects. 280-302 (1989); Wahl *et al.*, *J. Immunol.* 115: 476-481 (1975); Werb *et al.*, *J. Exp. Med.* 147:1684-1694 (1978)). Glucocorticoids retard wound healing by inhibiting angiogenesis, decreasing vascular permeability (Ebert *et al.*, *Am. Intern. Med.* 37:701-705 (1952)), fibroblast proliferation, and collagen synthesis (Beck *et al.*, *Growth Factors.* 5: 295-304 (1991); Haynes *et al.*, *J. Clin. Invest.* 61: 703-797 (1978)) and producing a transient reduction of circulating monocytes (Haynes *et al.*, *J. Clin. Invest.* 61: 703-797 (1978); Wahl, "Glucocorticoids and wound healing", In: Antiinflammatory Steroid Action: Basic and Clinical Aspects, Academic Press, New York, pp. 280-302 (1989)). The systemic administration of steroids to impaired wound healing is a well establish phenomenon in rats (Beck *et al.*, *Growth Factors.* 5: 295-304 (1991); Haynes *et al.*, *J. Clin. Invest.* 61: 703-797 (1978); Wahl, "Glucocorticoids and wound healing", In: Antiinflammatory Steroid Action: Basic and Clinical Aspects, Academic Press, New York, pp. 280-302 (1989); Pierce *et al.*, *Proc. Natl. Acad. Sci. USA* 86: 2229-2233 (1989)).

To demonstrate that an agonist or antagonist of the invention can accelerate the healing process, the effects of multiple topical applications of the agonist or antagonist on full thickness excisional skin wounds in rats in which healing has been impaired by the systemic administration of methylprednisolone is assessed.

Young adult male Sprague Dawley rats weighing 250-300 g (Charles River Laboratories) are used in this example. The animals are purchased at 8 weeks of age and are 9 weeks old at the beginning of the study. The healing response of rats is impaired by the systemic administration of methylprednisolone (17mg/kg/rat intramuscularly) at the time of wounding. Animals are individually housed and received food and water *ad libitum*. All manipulations are performed using aseptic techniques. This study is conducted according to the rules and guidelines of Human Genome Sciences, Inc. Institutional Animal Care and Use Committee and the Guidelines for the Care and Use of Laboratory Animals.

The wounding protocol is followed according to section A, above. On the day of wounding, animals are anesthetized with an intramuscular injection of ketamine (50 mg/kg) and xylazine (5 mg/kg). The dorsal region of the animal is shaved and the skin washed with 70% ethanol and iodine solutions. The surgical area is dried with sterile gauze prior to wounding. An 8 mm full-thickness wound is created using a Keyes tissue punch. The

wounds are left open for the duration of the experiment. Applications of the testing materials are given topically once a day for 7 consecutive days commencing on the day of wounding and subsequent to methylprednisolone administration. Prior to treatment, wounds are gently cleansed with sterile saline and gauze sponges.

5 Wounds are visually examined and photographed at a fixed distance at the day of wounding and at the end of treatment. Wound closure is determined by daily measurement on days 1-5 and on day 8. Wounds are measured horizontally and vertically using a calibrated Jameson caliper. Wounds are considered healed if granulation tissue is no longer visible and the wound is covered by a continuous epithelium.

10 The agonist or antagonist of the invention is administered using at a range different doses, from 4mg to 500mg per wound per day for 8 days in vehicle. Vehicle control groups received 50mL of vehicle solution.

 Animals are euthanized on day 8 with an intraperitoneal injection of sodium pentobarbital (300mg/kg). The wounds and surrounding skin are then harvested for
15 histology. Tissue specimens are placed in 10% neutral buffered formalin in tissue cassettes between biopsy sponges for further processing.

 Four groups of 10 animals each (5 with methylprednisolone and 5 without glucocorticoid) are evaluated: 1) Untreated group 2) Vehicle placebo control 3) treated groups.

20 Wound closure is analyzed by measuring the area in the vertical and horizontal axis and obtaining the total area of the wound. Closure is then estimated by establishing the differences between the initial wound area (day 0) and that of post treatment (day 8). The wound area on day 1 is 64mm², the corresponding size of the dermal punch. Calculations are made using the following formula:

25
$$[\text{Open area on day 8}] - [\text{Open area on day 1}] / [\text{Open area on day 1}]$$

 Specimens are fixed in 10% buffered formalin and paraffin embedded blocks are sectioned perpendicular to the wound surface (5mm) and cut using an Olympus microtome. Routine
30 hematoxylin-eosin (H&E) staining is performed on cross-sections of bisected wounds. Histologic examination of the wounds allows assessment of whether the healing process and the morphologic appearance of the repaired skin is improved by treatment with an agonist or

antagonist of the invention. A calibrated lens micrometer is used by a blinded observer to determine the distance of the wound gap.

Experimental data are analyzed using an unpaired t test. A p value of < 0.05 is considered significant.

- 5 The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 29: Lymphadema Animal Model

10

The purpose of this experimental approach is to create an appropriate and consistent lymphedema model for testing the therapeutic effects of an agonist or antagonist of the invention in lymphangiogenesis and re-establishment of the lymphatic circulatory system in the rat hind limb. Effectiveness is measured by swelling volume of the affected limb, quantification of the amount of lymphatic vasculature, total blood plasma protein, and histopathology. Acute lymphedema is observed for 7-10 days. Perhaps more importantly, the chronic progress of the edema is followed for up to 3-4 weeks.

15

Prior to beginning surgery, blood sample is drawn for protein concentration analysis. Male rats weighing approximately ~350g are dosed with Pentobarbital. Subsequently, the right legs are shaved from knee to hip. The shaved area is swabbed with gauze soaked in 70% EtOH. Blood is drawn for serum total protein testing. Circumference and volumetric measurements are made prior to injecting dye into paws after marking 2 measurement levels (0.5 cm above heel, at mid-pt of dorsal paw). The intradermal dorsum of both right and left paws are injected with 0.05 ml of 1% Evan's Blue. Circumference and volumetric measurements are then made following injection of dye into paws.

20

25

Using the knee joint as a landmark, a mid-leg inguinal incision is made circumferentially allowing the femoral vessels to be located. Forceps and hemostats are used to dissect and separate the skin flaps. After locating the femoral vessels, the lymphatic vessel that runs along side and underneath the vessel(s) is located. The main lymphatic vessels in this area are then electrically coagulated or suture ligated.

30

Using a microscope, muscles in back of the leg (near the semitendinosus and adductors) are bluntly dissected. The popliteal lymph node is then located. The 2 proximal

and 2 distal lymphatic vessels and distal blood supply of the popliteal node are then and ligated by suturing. The popliteal lymph node, and any accompanying adipose tissue, is then removed by cutting connective tissues.

Care is taken to control any mild bleeding resulting from this procedure. After
5 lymphatics are occluded, the skin flaps are sealed by using liquid skin (Vetbond) (AJ Buck). The separated skin edges are sealed to the underlying muscle tissue while leaving a gap of ~0.5 cm around the leg. Skin also may be anchored by suturing to underlying muscle when necessary.

To avoid infection, animals are housed individually with mesh (no bedding).
10 Recovering animals are checked daily through the optimal edematous peak, which typically occurred by day 5-7. The plateau edematous peak are then observed. To evaluate the intensity of the lymphedema, the circumference and volumes of 2 designated places on each paw before operation and daily for 7 days are measured. The effect plasma proteins on lymphedema is determined and whether protein analysis is a useful testing perimeter is also
15 investigated. The weights of both control and edematous limbs are evaluated at 2 places. Analysis is performed in a blind manner.

Circumference Measurements: Under brief gas anesthetic to prevent limb movement, a cloth tape is used to measure limb circumference. Measurements are done at the ankle bone and dorsal paw by 2 different people then those 2 readings are averaged. Readings are
20 taken from both control and edematous limbs.

Volumetric Measurements: On the day of surgery, animals are anesthetized with Pentobarbital and are tested prior to surgery. For daily volumetrics animals are under brief halothane anesthetic (rapid immobilization and quick recovery), both legs are shaved and equally marked using waterproof marker on legs. Legs are first dipped in water, then dipped
25 into instrument to each marked level then measured by Buxco edema software(Chen/Victor). Data is recorded by one person, while the other is dipping the limb to marked area.

Blood-plasma protein measurements: Blood is drawn, spun, and serum separated prior to surgery and then at conclusion for total protein and Ca²⁺ comparison.

Limb Weight Comparison: After drawing blood, the animal is prepared for tissue
30 collection. The limbs are amputated using a quillitine, then both experimental and control legs are cut at the ligature and weighed. A second weighing is done as the tibio-cacaneal joint is disarticulated and the foot is weighed.

Histological Preparations: The transverse muscle located behind the knee (popliteal) area is dissected and arranged in a metal mold, filled with freezeGel, dipped into cold methylbutane, placed into labeled sample bags at - 80EC until sectioning. Upon sectioning, the muscle is observed under fluorescent microscopy for lymphatics..

- 5 The studies described in this example tested activity of agonists or antagonists of the invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

10 *Example 30: Suppression of TNF alpha-induced adhesion molecule expression by a Agonist or Antagonist of the Invention*

The recruitment of lymphocytes to areas of inflammation and angiogenesis involves specific receptor-ligand interactions between cell surface adhesion molecules (CAMs) on lymphocytes and the vascular endothelium. The adhesion process, in both normal and
15 pathological settings, follows a multi-step cascade that involves intercellular adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule-1 (VCAM-1), and endothelial leukocyte adhesion molecule-1 (E-selectin) expression on endothelial cells (EC). The expression of these molecules and others on the vascular endothelium determines the efficiency with which leukocytes may adhere to the local vasculature and extravasate into the
20 local tissue during the development of an inflammatory response. The local concentration of cytokines and growth factor participate in the modulation of the expression of these CAMs.

Tumor necrosis factor alpha (TNF-a), a potent proinflammatory cytokine, is a stimulator of all three CAMs on endothelial cells and may be involved in a wide variety of inflammatory responses, often resulting in a pathological outcome.

- 25 The potential of an agonist or antagonist of the invention to mediate a suppression of TNF-a induced CAM expression can be examined. A modified ELISA assay which uses ECs as a solid phase absorbent is employed to measure the amount of CAM expression on TNF-a treated ECs when co-stimulated with a member of the FGF family of proteins.

To perform the experiment, human umbilical vein endothelial cell (HUVEC) cultures
30 are obtained from pooled cord harvests and maintained in growth medium (EGM-2; Clonetics, San Diego, CA) supplemented with 10% FCS and 1% penicillin/streptomycin in a 37 degree C humidified incubator containing 5% CO₂. HUVECs are seeded in 96-well

plates at concentrations of 1×10^4 cells/well in EGM medium at 37 degree C for 18-24 hrs or until confluent. The monolayers are subsequently washed 3 times with a serum-free solution of RPMI-1640 supplemented with 100 U/ml penicillin and 100 mg/ml streptomycin, and treated with a given cytokine and/or growth factor(s) for 24 h at 37 degree C. Following
5 incubation, the cells are then evaluated for CAM expression.

Human Umbilical Vein Endothelial cells (HUVECs) are grown in a standard 96 well plate to confluence. Growth medium is removed from the cells and replaced with 90 ul of 199 Medium (10% FBS). Samples for testing and positive or negative controls are added to the plate in triplicate (in 10 ul volumes). Plates are incubated at 37 degree C for either 5 h
10 (selectin and integrin expression) or 24 h (integrin expression only). Plates are aspirated to remove medium and 100 μ l of 0.1% paraformaldehyde-PBS(with Ca^{++} and Mg^{++}) is added to each well. Plates are held at 4°C for 30 min.

Fixative is then removed from the wells and wells are washed 1X with PBS(+Ca,Mg)+0.5% BSA and drained. Do not allow the wells to dry. Add 10 μ l of diluted
15 primary antibody to the test and control wells. Anti-ICAM-1-Biotin, Anti-VCAM-1-Biotin and Anti-E-selectin-Biotin are used at a concentration of 10 μ g/ml (1:10 dilution of 0.1 mg/ml stock antibody). Cells are incubated at 37°C for 30 min. in a humidified environment. Wells are washed X3 with PBS(+Ca,Mg)+0.5% BSA.

Then add 20 μ l of diluted ExtrAvidin-Alkaline Phosphatase (1:5,000 dilution) to each
20 well and incubated at 37°C for 30 min. Wells are washed X3 with PBS(+Ca,Mg)+0.5% BSA. 1 tablet of p-Nitrophenol Phosphate pNPP is dissolved in 5 ml of glycine buffer (pH 10.4). 100 μ l of pNPP substrate in glycine buffer is added to each test well. Standard wells in triplicate are prepared from the working dilution of the ExtrAvidin-Alkaline Phosphatase in glycine buffer: 1:5,000 (10^0) > $10^{-0.5}$ > 10^{-1} > $10^{-1.5}$. 5 μ l of each dilution is added to triplicate
25 wells and the resulting AP content in each well is 5.50 ng, 1.74 ng, 0.55 ng, 0.18 ng. 100 μ l of pNPP reagent must then be added to each of the standard wells. The plate must be incubated at 37°C for 4h. A volume of 50 μ l of 3M NaOH is added to all wells. The results are quantified on a plate reader at 405 nm. The background subtraction option is used on blank wells filled with glycine buffer only. The template is set up to indicate the
30 concentration of AP-conjugate in each standard well [5.50 ng; 1.74 ng; 0.55 ng; 0.18 ng]. Results are indicated as amount of bound AP-conjugate in each sample.

The studies described in this example tested activity of agonists or antagonists of the

invention. However, one skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides or polypeptides of the invention (e.g., gene therapy).

Example 31: Production Of Polypeptide of the Invention For High-Throughput Screening Assays

The following protocol produces a supernatant containing polypeptide of the present invention to be tested. This supernatant can then be used in the Screening Assays described in Examples 33-42.

First, dilute Poly-D-Lysine (644 587 Boehringer-Mannheim) stock solution (1mg/ml in PBS) 1:20 in PBS (w/o calcium or magnesium 17-516F Biowhittaker) for a working solution of 50ug/ml. Add 200 ul of this solution to each well (24 well plates) and incubate at RT for 20 minutes. Be sure to distribute the solution over each well (note: a 12-channel pipetter may be used with tips on every other channel). Aspirate off the Poly-D-Lysine solution and rinse with 1ml PBS (Phosphate Buffered Saline). The PBS should remain in the well until just prior to plating the cells and plates may be poly-lysine coated in advance for up to two weeks.

Plate 293T cells (do not carry cells past P+20) at 2×10^5 cells/well in .5ml DMEM(Dulbecco's Modified Eagle Medium)(with 4.5 G/L glucose and L-glutamine (12-604F Biowhittaker))/10% heat inactivated FBS(14-503F Biowhittaker)/1x Penstrep(17-602E Biowhittaker). Let the cells grow overnight.

The next day, mix together in a sterile solution basin: 300 ul Lipofectamine (18324-012 Gibco/BRL) and 5ml Optimem I (31985070 Gibco/BRL)/96-well plate. With a small volume multi-channel pipetter, aliquot approximately 2ug of an expression vector containing a polynucleotide insert, produced by the methods described in Examples 8-10, into an appropriately labeled 96-well round bottom plate. With a multi-channel pipetter, add 50ul of the Lipofectamine/Optimem I mixture to each well. Pipette up and down gently to mix. Incubate at RT 15-45 minutes. After about 20 minutes, use a multi-channel pipetter to add 150ul Optimem I to each well. As a control, one plate of vector DNA lacking an insert should be transfected with each set of transfections.

Preferably, the transfection should be performed by tag-teaming the following tasks. By tag-teaming, hands on time is cut in half, and the cells do not spend too much time on

PBS. First, person A aspirates off the media from four 24-well plates of cells, and then person B rinses each well with .5-1ml PBS. Person A then aspirates off PBS rinse, and person B, using a 12-channel pipetter with tips on every other channel, adds the 200ul of DNA/Lipofectamine/Optimem 1 complex to the odd wells first, then to the even wells, to each row on the 24-well plates. Incubate at 37 degree C for 6 hours.

While cells are incubating, prepare appropriate media, either 1%BSA in DMEM with 1x penstrep, or HGS CHO-5 media (116.6 mg/L of CaCl₂ (anhyd); 0.00130 mg/L CuSO₄-5H₂O; 0.050 mg/L of Fe(NO₃)₃-9H₂O; 0.417 mg/L of FeSO₄-7H₂O; 311.80 mg/L of KCl; 28.64 mg/L of MgCl₂; 48.84 mg/L of MgSO₄; 6995.50 mg/L of NaCl; 2400.0 mg/L of NaHCO₃; 62.50 mg/L of NaH₂PO₄-H₂O; 71.02 mg/L of Na₂HPO₄; .4320 mg/L of ZnSO₄-7H₂O; .002 mg/L of Arachidonic Acid ; 1.022 mg/L of Cholesterol; .070 mg/L of DL-alpha-Tocopherol-Acetate; 0.0520 mg/L of Linoleic Acid; 0.010 mg/L of Linolenic Acid; 0.010 mg/L of Myristic Acid; 0.010 mg/L of Oleic Acid; 0.010 mg/L of Palmitic Acid; 0.010 mg/L of Palmitic Acid; 100 mg/L of Pluronic F-68; 0.010 mg/L of Stearic Acid; 2.20 mg/L of Tween 80; 4551 mg/L of D-Glucose; 130.85 mg/ml of L- Alanine; 147.50 mg/ml of L-Arginine-HCL; 7.50 mg/ml of L-Asparagine-H₂O; 6.65 mg/ml of L-Aspartic Acid; 29.56 mg/ml of L-Cystine-2HCL-H₂O; 31.29 mg/ml of L-Cystine-2HCL; 7.35 mg/ml of L-Glutamic Acid; 365.0 mg/ml of L-Glutamine; 18.75 mg/ml of Glycine; 52.48 mg/ml of L-Histidine-HCL-H₂O; 106.97 mg/ml of L-Isoleucine; 111.45 mg/ml of L-Leucine; 163.75 mg/ml of L-Lysine HCL; 32.34 mg/ml of L-Methionine; 68.48 mg/ml of L-Phenylalanine; 40.0 mg/ml of L-Proline; 26.25 mg/ml of L-Serine; 101.05 mg/ml of L-Threonine; 19.22 mg/ml of L-Tryptophan; 91.79 mg/ml of L-Tyrosine-2Na-2H₂O; and 99.65 mg/ml of L-Valine; 0.0035 mg/L of Biotin; 3.24 mg/L of D-Ca Pantothenate; 11.78 mg/L of Choline Chloride; 4.65 mg/L of Folic Acid; 15.60 mg/L of i-Inositol; 3.02 mg/L of Niacinamide; 3.00 mg/L of Pyridoxal HCL; 0.031 mg/L of Pyridoxine HCL; 0.319 mg/L of Riboflavin; 3.17 mg/L of Thiamine HCL; 0.365 mg/L of Thymidine; 0.680 mg/L of Vitamin B₁₂; 25 mM of HEPES Buffer; 2.39 mg/L of Na Hypoxanthine; 0.105 mg/L of Lipoic Acid; 0.081 mg/L of Sodium Putrescine-2HCL; 55.0 mg/L of Sodium Pyruvate; 0.0067 mg/L of Sodium Selenite; 20uM of Ethanolamine; 0.122 mg/L of Ferric Citrate; 41.70 mg/L of Methyl-B-Cyclodextrin complexed with Linoleic Acid; 33.33 mg/L of Methyl-B-Cyclodextrin complexed with Oleic Acid; 10 mg/L of Methyl-B-Cyclodextrin complexed with Retinal Acetate. Adjust

osmolarity to 327 mOsm) with 2mm glutamine and 1x penstrep. (BSA (81-068-3 Bayer) 100gm dissolved in 1L DMEM for a 10% BSA stock solution). Filter the media and collect 50 ul for endotoxin assay in 15ml polystyrene conical.

5 The transfection reaction is terminated, preferably by tag-teaming, at the end of the incubation period. Person A aspirates off the transfection media, while person B adds 1.5ml appropriate media to each well. Incubate at 37 degree C for 45 or 72 hours depending on the media used: 1%BSA for 45 hours or CHO-5 for 72 hours.

10 On day four, using a 300ul multichannel pipetter, aliquot 600ul in one 1ml deep well plate and the remaining supernatant into a 2ml deep well. The supernatants from each well can then be used in the assays described in Examples 33-40.

It is specifically understood that when activity is obtained in any of the assays described below using a supernatant, the activity originates from either the polypeptide of the present invention directly (e.g., as a secreted protein) or by polypeptide of the present invention inducing expression of other proteins, which are then secreted into the supernatant.
15 Thus, the invention further provides a method of identifying the protein in the supernatant characterized by an activity in a particular assay.

Example 32: Construction of GAS Reporter Construct

20 One signal transduction pathway involved in the differentiation and proliferation of cells is called the Jaks-STATs pathway. Activated proteins in the Jaks-STATs pathway bind to gamma activation site "GAS" elements or interferon-sensitive responsive element ("ISRE"), located in the promoter of many genes. The binding of a protein to these elements alter the expression of the associated gene.

25 GAS and ISRE elements are recognized by a class of transcription factors called Signal Transducers and Activators of Transcription, or "STATs." There are six members of the STATs family. Stat1 and Stat3 are present in many cell types, as is Stat2 (as response to IFN-alpha is widespread). Stat4 is more restricted and is not in many cell types though it has been found in T helper class 1, cells after treatment with IL-12. Stat5 was originally called
30 mammary growth factor, but has been found at higher concentrations in other cells including myeloid cells. It can be activated in tissue culture cells by many cytokines.

The STATs are activated to translocate from the cytoplasm to the nucleus upon

tyrosine phosphorylation by a set of kinases known as the Janus Kinase ("Jaks") family. Jaks represent a distinct family of soluble tyrosine kinases and include Tyk2, Jak1, Jak2, and Jak3. These kinases display significant sequence similarity and are generally catalytically inactive in resting cells.

5 The Jaks are activated by a wide range of receptors summarized in the Table below. (Adapted from review by Schidler and Darnell, *Ann. Rev. Biochem.* 64:621-51 (1995).) A cytokine receptor family, capable of activating Jaks, is divided into two groups: (a) Class 1 includes receptors for IL-2, IL-3, IL-4, IL-6, IL-7, IL-9, IL-11, IL-12, IL-15, Epo, PRL, GH, G-CSF, GM-CSF, LIF, CNTF, and thrombopoietin; and (b) Class 2 includes IFN- α , IFN- γ ,
10 and IL-10. The Class 1 receptors share a conserved cysteine motif (a set of four conserved cysteines and one tryptophan) and a WSXWS motif (a membrane proximal region encoding Trp-Ser-Xxx-Trp-Ser (SEQ ID NO:1686)).

 Thus, on binding of a ligand to a receptor, Jaks are activated, which in turn activate STATs, which then translocate and bind to GAS elements. This entire process is
15 encompassed in the Jaks-STATs signal transduction pathway.

 Therefore, activation of the Jaks-STATs pathway, reflected by the binding of the GAS or the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. For example, growth factors and cytokines are known to activate the Jaks-STATs pathway. (See Table below.) Thus, by using GAS elements linked to reporter
20 molecules, activators of the Jaks-STATs pathway can be identified.

	<u>Ligand</u>	<u>tyk2</u>	<u>JAKs</u>			<u>STATS GAS(elements) or ISRE</u>
			<u>Jak1</u>	<u>Jak2</u>	<u>Jak3</u>	
	<u>IFN family</u>					
5	IFN-a/B	+	+	-	-	1,2,3 ISRE
	IFN-g (IRF1>Lys6>IFP)		+	+	-	1 GAS
	IL-10	+	?	?	-	1,3
10	<u>gp130 family</u>					
	IL-6 (Pleiotrohic) (IRF1>Lys6>IFP)	+	+	+	?	1,3 GAS
	IL-11(Pleiotrohic)	?	+	?	?	1,3
	OnM(Pleiotrohic)	?	+	+	?	1,3
15	LIF(Pleiotrohic)	?	+	+	?	1,3
	CNTF(Pleiotrohic)	-/+	+	+	?	1,3
	G-CSF(Pleiotrohic)	?	+	?	?	1,3
	IL-12(Pleiotrohic)	+	-	+	+	1,3
20	<u>g-C family</u>					
	IL-2 (lymphocytes)	-	+	-	+	1,3,5 GAS
	IL-4 (lymph/myeloid) >>Ly6)(IgH)	-	+	-	+	6 GAS (IRF1 = IFP
	IL-7 (lymphocytes)	-	+	-	+	5 GAS
25	IL-9 (lymphocytes)	-	+	-	+	5 GAS
	IL-13 (lymphocyte)	-	+	?	?	6 GAS
	IL-15	?	+	?	+	5 GAS
	<u>gp140 family</u>					
30	IL-3 (myeloid) (IRF1>IFP>>Ly6)	-	-	+	-	5 GAS
	IL-5 (myeloid)	-	-	+	-	5 GAS
	GM-CSF (myeloid)	-	-	+	-	5 GAS

510

Growth hormone family

	GH	?	-	+	-	5	
	PRL	?	+/-	+	-	1,3,5	
5	EPO	?	-	+	-	5	GAS(B-
	CAS>IRF1=IFP>>Ly6)						

Receptor Tyrosine Kinases

10	EGF	?	+	+	-	1,3	GAS (IRF1)
	PDGF	?	+	+	-	1,3	
	CSF-1	?	+	+	-	1,3	GAS (not IRF1)

To construct a synthetic GAS containing promoter element, which is used in the Biological Assays described in Examples 33-34, a PCR based strategy is employed to generate a GAS-SV40 promoter sequence. The 5' primer contains four tandem copies of the GAS binding site found in the IRF1 promoter and previously demonstrated to bind STATs upon induction with a range of cytokines (Rothman et al., Immunity 1:457-468 (1994).), although other GAS or ISRE elements can be used instead. The 5' primer also contains 18bp of sequence complementary to the SV40 early promoter sequence and is flanked with an XhoI site. The sequence of the 5' primer is:

5':GCGCCTCGAGATTTCCTCCCGAAATCTAGATTTCCTCCCGAAATGATTTCCTCCCGAAATGATTTCCTCCCGAAATATCTGCCATCTCAATTAG:3' (SEQ ID NO:1687)

The downstream primer is complementary to the SV40 promoter and is flanked with a Hind III site: 5':GCGGCAAGCTTTTTTGCAAAGCCTAGGC:3' (SEQ ID NO:1688)

PCR amplification is performed using the SV40 promoter template present in the B-gal:promoter plasmid obtained from Clontech. The resulting PCR fragment is digested with XhoI/Hind III and subcloned into BLSK2-. (Stratagene.) Sequencing with forward and reverse primers confirms that the insert contains the following sequence:

5':CTCGAGATTTCCTCCCGAAATCTAGATTTCCTCCCGAAATGATTTCCTCCCGAAATGATTTCCTCCCGAAATATCTGCCATCTCAATTAGTCAGCAACCATAGTCCCGCCCTAACTCCGCCCATCCCGCCCCTAACTCCGCCCAGTTCCGCCCATTCTCCGCCCCATGGCTGACTAATTTTTTTTATTTATGCAGAGGCCGAGGCCGCCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTT:3' (SEQ ID NO:1689)

With this GAS promoter element linked to the SV40 promoter, a GAS:SEAP2 reporter construct is next engineered. Here, the reporter molecule is a secreted alkaline phosphatase, or "SEAP." Clearly, however, any reporter molecule can be instead of SEAP, in this or in any of the other Examples. Well known reporter molecules that can be used instead of SEAP include chloramphenicol

acetyltransferase (CAT), luciferase, alkaline phosphatase, B-galactosidase, green fluorescent protein (GFP), or any protein detectable by an antibody.

The above sequence confirmed synthetic GAS-SV40 promoter element is subcloned into the pSEAP-Promoter vector obtained from Clontech using HindIII and XhoI, effectively replacing the SV40 promoter with the amplified GAS:SV40 promoter element, to create the GAS-SEAP vector. However, this vector does not contain a neomycin resistance gene, and therefore, is not preferred for mammalian expression systems.

Thus, in order to generate mammalian stable cell lines expressing the GAS-SEAP reporter, the GAS-SEAP cassette is removed from the GAS-SEAP vector using SalI and NotI, and inserted into a backbone vector containing the neomycin resistance gene, such as pGFP-1 (Clontech), using these restriction sites in the multiple cloning site, to create the GAS-SEAP/Neo vector. Once this vector is transfected into mammalian cells, this vector can then be used as a reporter molecule for GAS binding as described in Examples 33-34.

Other constructs can be made using the above description and replacing GAS with a different promoter sequence. For example, construction of reporter molecules containing NFK-B and EGR promoter sequences are described in Examples 35 and 36. However, many other promoters can be substituted using the protocols described in these Examples. For instance, SRE, IL-2, NFAT, or Osteocalcin promoters can be substituted, alone or in combination (e.g., GAS/NF-KB/EGR, GAS/NF-KB, IL-2/NFAT, or NF-KB/GAS). Similarly, other cell lines can be used to test reporter construct activity, such as HELA (epithelial), HUVEC (endothelial), Reh (B-cell), Saos-2 (osteoblast), HUVAC (aortic), or Cardiomyocyte.

Example 33: High-Throughput Screening Assay for T-cell Activity.

The following protocol is used to assess T-cell activity by identifying factors, and determining whether supernate containing a polypeptide of the invention proliferates and/or differentiates T-cells. T-cell activity is assessed using the

GAS/SEAP/Neo construct produced in Example 32. Thus, factors that increase SEAP activity indicate the ability to activate the Jaks-STATS signal transduction pathway. The T-cell used in this assay is Jurkat T-cells (ATCC Accession No. TIB-152), although Molt-3 cells (ATCC Accession No. CRL-1552) and Molt-4 cells (ATCC
5 Accession No. CRL-1582) cells can also be used.

Jurkat T-cells are lymphoblastic CD4+ Th1 helper cells. In order to generate stable cell lines, approximately 2 million Jurkat cells are transfected with the GAS-SEAP/neo vector using DMRIE-C (Life Technologies)(transfection procedure described below). The transfected cells are seeded to a density of approximately
10 20,000 cells per well and transfectants resistant to 1 mg/ml gentamicin selected. Resistant colonies are expanded and then tested for their response to increasing concentrations of interferon gamma. The dose response of a selected clone is demonstrated.

Specifically, the following protocol will yield sufficient cells for 75 wells
15 containing 200 ul of cells. Thus, it is either scaled up, or performed in multiple to generate sufficient cells for multiple 96 well plates. Jurkat cells are maintained in RPMI + 10% serum with 1%Pen-Strep. Combine 2.5 mls of OPTI-MEM (Life Technologies) with 10 ug of plasmid DNA in a T25 flask. Add 2.5 ml OPTI-MEM containing 50 ul of DMRIE-C and incubate at room temperature for 15-45 mins.

20 During the incubation period, count cell concentration, spin down the required number of cells (10^7 per transfection), and resuspend in OPTI-MEM to a final concentration of 10^7 cells/ml. Then add 1ml of 1×10^7 cells in OPTI-MEM to T25 flask and incubate at 37 degree C for 6 hrs. After the incubation, add 10 ml of RPMI + 15% serum.

25 The Jurkat:GAS-SEAP stable reporter lines are maintained in RPMI + 10% serum, 1 mg/ml Gentamicin, and 1% Pen-Strep. These cells are treated with supernatants containing polypeptide of the present invention or polypeptide of the present invention induced polypeptides as produced by the protocol described in Example 31.

30 On the day of treatment with the supernatant, the cells should be washed and

resuspended in fresh RPMI + 10% serum to a density of 500,000 cells per ml. The exact number of cells required will depend on the number of supernatants being screened. For one 96 well plate, approximately 10 million cells (for 10 plates, 100 million cells) are required.

- 5 Transfer the cells to a triangular reservoir boat, in order to dispense the cells into a 96 well dish, using a 12 channel pipette. Using a 12 channel pipette, transfer 200 ul of cells into each well (therefore adding 100, 000 cells per well).

- After all the plates have been seeded, 50 ul of the supernatants are transferred directly from the 96 well plate containing the supernatants into each well using a 12
10 channel pipette. In addition, a dose of exogenous interferon gamma (0.1, 1.0, 10 ng) is added to wells H9, H10, and H11 to serve as additional positive controls for the assay.

- The 96 well dishes containing Jurkat cells treated with supernatants are placed in an incubator for 48 hrs (note: this time is variable between 48-72 hrs). 35 ul
15 samples from each well are then transferred to an opaque 96 well plate using a 12 channel pipette. The opaque plates should be covered (using sellophane covers) and stored at -20 degree C until SEAP assays are performed according to Example 37. The plates containing the remaining treated cells are placed at 4 degree C and serve as a source of material for repeating the assay on a specific well if desired.

- 20 As a positive control, 100 Unit/ml interferon gamma can be used which is known to activate Jurkat T cells. Over 30 fold induction is typically observed in the positive control wells.

- The above protocol may be used in the generation of both transient, as well as, stable transfected cells, which would be apparent to those of skill in the art.

25

Example 34: High-Throughput Screening Assay Identifying Myeloid Activity

- The following protocol is used to assess myeloid activity of polypeptide of the present invention by determining whether polypeptide of the present invention
30 proliferates and/or differentiates myeloid cells. Myeloid cell activity is assessed using

the GAS/SEAP/Neo construct produced in Example 32. Thus, factors that increase SEAP activity indicate the ability to activate the Jaks-STATS signal transduction pathway. The myeloid cell used in this assay is U937, a pre-monocyte cell line, although TF-1, HL60, or KG1 can be used.

5 To transiently transfect U937 cells with the GAS/SEAP/Neo construct produced in Example 32, a DEAE-Dextran method (Kharbanda et. al., 1994, Cell Growth & Differentiation, 5:259-265) is used. First, harvest 2×10^7 U937 cells and wash with PBS. The U937 cells are usually grown in RPMI 1640 medium containing 10% heat-inactivated fetal bovine serum (FBS) supplemented with 100 units/ml
10 penicillin and 100 mg/ml streptomycin.

Next, suspend the cells in 1 ml of 20 mM Tris-HCl (pH 7.4) buffer containing 0.5 mg/ml DEAE-Dextran, 8 ug GAS-SEAP2 plasmid DNA, 140 mM NaCl, 5 mM KCl, 375 uM $\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$, 1 mM MgCl_2 , and 675 uM CaCl_2 . Incubate at 37 degrees C for 45 min.

15 Wash the cells with RPMI 1640 medium containing 10% FBS and then resuspend in 10 ml complete medium and incubate at 37 degree C for 36 hr.

The GAS-SEAP/U937 stable cells are obtained by growing the cells in 400 ug/ml G418. The G418-free medium is used for routine growth but every one to two months, the cells should be re-grown in 400 ug/ml G418 for couple of passages.

20 These cells are tested by harvesting 1×10^8 cells (this is enough for ten 96-well plates assay) and wash with PBS. Suspend the cells in 200 ml above described growth medium, with a final density of 5×10^5 cells/ml. Plate 200 ul cells per well in the 96-well plate (or 1×10^5 cells/well).

Add 50 ul of the supernatant prepared by the protocol described in Example
25 31. Incubate at 37 degree C for 48 to 72 hr. As a positive control, 100 Unit/ml interferon gamma can be used which is known to activate U937 cells. Over 30 fold induction is typically observed in the positive control wells. SEAP assay the supernatant according to the protocol described in Example 37.

30 *Example 35: High-Throughput Screening Assay Identifying Neuronal Activity.*

When cells undergo differentiation and proliferation, a group of genes are activated through many different signal transduction pathways. One of these genes, EGR1 (early growth response gene 1), is induced in various tissues and cell types upon activation. The promoter of EGR1 is responsible for such induction. Using the EGR1 promoter linked to reporter molecules, activation of cells can be assessed by polypeptide of the present invention.

Particularly, the following protocol is used to assess neuronal activity in PC12 cell lines. PC12 cells (rat pheochromocytoma cells) are known to proliferate and/or differentiate by activation with a number of mitogens, such as TPA (tetradecanoyl phorbol acetate), NGF (nerve growth factor), and EGF (epidermal growth factor). The EGR1 gene expression is activated during this treatment. Thus, by stably transfecting PC12 cells with a construct containing an EGR promoter linked to SEAP reporter, activation of PC12 cells by polypeptide of the present invention can be assessed.

The EGR/SEAP reporter construct can be assembled by the following protocol. The EGR-1 promoter sequence (-633 to +1)(Sakamoto K et al., Oncogene 6:867-871 (1991)) can be PCR amplified from human genomic DNA using the following primers:

5' GCGCTCGAGGGATGACAGCGATAGAACCCCGG -3' (SEQ ID NO: 1690)

5' GCGAAGCTTCGCGACTCCCCGGATCCGCCTC-3' (SEQ ID NO: 1691)

Using the GAS:SEAP/Neo vector produced in Example 32, EGR1 amplified product can then be inserted into this vector. Linearize the GAS:SEAP/Neo vector using restriction enzymes XhoI/HindIII, removing the GAS/SV40 stuffer. Restrict the EGR1 amplified product with these same enzymes. Ligate the vector and the EGR1 promoter.

To prepare 96 well-plates for cell culture, two mls of a coating solution (1:30 dilution of collagen type I (Upstate Biotech Inc. Cat#08-115) in 30% ethanol (filter

sterilized)) is added per one 10 cm plate or 50 ml per well of the 96-well plate, and allowed to air dry for 2 hr.

PC12 cells are routinely grown in RPMI-1640 medium (Bio Whittaker) containing 10% horse serum (JRH BIOSCIENCES, Cat. # 12449-78P), 5% heat-inactivated fetal bovine serum (FBS) supplemented with 100 units/ml penicillin and 100 ug/ml streptomycin on a precoated 10 cm tissue culture dish. One to four split is done every three to four days. Cells are removed from the plates by scraping and resuspended with pipetting up and down for more than 15 times.

Transfect the EGR/SEAP/Neo construct into PC12 using the Lipofectamine protocol described in Example 31. EGR-SEAP/PC12 stable cells are obtained by growing the cells in 300 ug/ml G418. The G418-free medium is used for routine growth but every one to two months, the cells should be re-grown in 300 ug/ml G418 for couple of passages.

To assay for neuronal activity, a 10 cm plate with cells around 70 to 80% confluent is screened by removing the old medium. Wash the cells once with PBS (Phosphate buffered saline). Then starve the cells in low serum medium (RPMI-1640 containing 1% horse serum and 0.5% FBS with antibiotics) overnight.

The next morning, remove the medium and wash the cells with PBS. Scrape off the cells from the plate, suspend the cells well in 2 ml low serum medium. Count the cell number and add more low serum medium to reach final cell density as 5×10^5 cells/ml.

Add 200 ul of the cell suspension to each well of 96-well plate (equivalent to 1×10^5 cells/well). Add 50 ul supernatant produced by Example 31, 37 degree C for 48 to 72 hr. As a positive control, a growth factor known to activate PC12 cells through EGR can be used, such as 50 ng/ul of Neuronal Growth Factor (NGF). Over fifty-fold induction of SEAP is typically seen in the positive control wells. SEAP assay the supernatant according to Example 37.

Example 36: High-Throughput Screening Assay for T-cell Activity

NF-KB (Nuclear Factor KB) is a transcription factor activated by a wide variety of agents including the inflammatory cytokines IL-1 and TNF, CD30 and CD40, lymphotoxin-alpha and lymphotoxin-beta, by exposure to LPS or thrombin, and by expression of certain viral gene products. As a transcription factor, NF-KB
5 regulates the expression of genes involved in immune cell activation, control of apoptosis (NF- KB appears to shield cells from apoptosis), B and T-cell development, anti-viral and antimicrobial responses, and multiple stress responses.

In non-stimulated conditions, NF- KB is retained in the cytoplasm with I-KB (Inhibitor KB). However, upon stimulation, I- KB is phosphorylated and degraded,
10 causing NF- KB to shuttle to the nucleus, thereby activating transcription of target genes. Target genes activated by NF- KB include IL-2, IL-6, GM-CSF, ICAM-1 and class I MHC.

Due to its central role and ability to respond to a range of stimuli, reporter constructs utilizing the NF-KB promoter element are used to screen the supernatants
15 produced in Example 31. Activators or inhibitors of NF-KB would be useful in treating, preventing, and/or diagnosing diseases. For example, inhibitors of NF-KB could be used to treat those diseases related to the acute or chronic activation of NF-KB, such as rheumatoid arthritis.

To construct a vector containing the NF-KB promoter element, a PCR based
20 strategy is employed. The upstream primer contains four tandem copies of the NF-KB binding site (GGGGACTTTCCC) (SEQ ID NO:1692), 18 bp of sequence complementary to the 5' end of the SV40 early promoter sequence, and is flanked with an XhoI site:

5':GCGGCCTCGAGGGGACTTTCCCGGGGACTTTCCGGGGACTTTCCGGGAC
25 TTTCCATCCTGCCATCTCAATTAG:3' (SEQ ID NO:1693)

The downstream primer is complementary to the 3' end of the SV40 promoter and is flanked with a Hind III site:

5':GCGGCAAGCTTTTGGCAAAGCCTAGGC:3' (SEQ ID NO:1688)

PCR amplification is performed using the SV40 promoter template present in
30 the pB-gal:promoter plasmid obtained from Clontech. The resulting PCR fragment is

digested with XhoI and Hind III and subcloned into BLSK2-. (Stratagene) Sequencing with the T7 and T3 primers confirms the insert contains the following sequence:

5':CTCGAGGGGACTTTCCCGGGGACTTTCCGGGGACTTTCCGGGACTTTCC
5 ATCTGCCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCTAACTCCGCCC
ATCCCGCCCCTAACTCCGCCCAGTTCCGCCCATTCTCCGCCCCATGGCTGA
CTAATTTTTTTTATTTATGCAGAGGCCGAGGCCGCCTCGGCCTCTGAGCTA
TTCCAGAAGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAA
GCTT:3' (SEQ ID NO:1694)

10 Next, replace the SV40 minimal promoter element present in the pSEAP2-promoter plasmid (Clontech) with this NF-KB/SV40 fragment using XhoI and HindIII. However, this vector does not contain a neomycin resistance gene, and therefore, is not preferred for mammalian expression systems.

15 In order to generate stable mammalian cell lines, the NF-KB/SV40/SEAP cassette is removed from the above NF-KB/SEAP vector using restriction enzymes SalI and NotI, and inserted into a vector containing neomycin resistance. Particularly, the NF-KB/SV40/SEAP cassette was inserted into pGFP-1 (Clontech), replacing the GFP gene, after restricting pGFP-1 with SalI and NotI.

20 Once NF-KB/SV40/SEAP/Neo vector is created, stable Jurkat T-cells are created and maintained according to the protocol described in Example 33. Similarly, the method for assaying supernatants with these stable Jurkat T-cells is also described in Example 33. As a positive control, exogenous TNF alpha (0.1, 1, 10 ng) is added to wells H9, H10, and H11, with a 5-10 fold activation typically observed.

25 *Example 37: Assay for SEAP Activity*

As a reporter molecule for the assays described in Examples 33-36, SEAP activity is assayed using the Tropix Phospho-light Kit (Cat. BP-400) according to the following general procedure. The Tropix Phospho-light Kit supplies the Dilution,
30 Assay, and Reaction Buffers used below.

Prime a dispenser with the 2.5x Dilution Buffer and dispense 15 ul of 2.5x dilution buffer into Optiplates containing 35 ul of a supernatant. Seal the plates with a plastic sealer and incubate at 65 degree C for 30 min. Separate the Optiplates to avoid uneven heating.

- 5 Cool the samples to room temperature for 15 minutes. Empty the dispenser and prime with the Assay Buffer. Add 50 ml Assay Buffer and incubate at room temperature 5 min. Empty the dispenser and prime with the Reaction Buffer (see the table below).. Add 50 ul Reaction Buffer and incubate at room temperature for 20 minutes. Since the intensity of the chemiluminescent signal is time dependent, and it
- 10 takes about 10 minutes to read 5 plates on luminometer, one should treat 5 plates at each time and start the second set 10 minutes later.

Read the relative light unit in the luminometer. Set H12 as blank, and print the results. An increase in chemiluminescence indicates reporter activity.

15 Reaction Buffer Formulation:

# of plates	Rxn buffer diluent (ml)	CSPD (ml)
10	60	3
11	65	3.25
12	70	3.5
13	75	3.75
14	80	4
15	85	4.25
16	90	4.5
17	95	4.75
18	100	5
19	105	5.25
20	110	5.5
21	115	5.75
22	120	6

23	125	6.25
24	130	6.5
25	135	6.75
26	140	7
27	145	7.25
28	150	7.5
29	155	7.75
30	160	8
31	165	8.25
32	170	8.5
33	175	8.75
34	180	9
35	185	9.25
36	190	9.5
37	195	9.75
38	200	10
39	205	10.25
40	210	10.5
41	215	10.75
42	220	11
43	225	11.25
44	230	11.5
45	235	11.75
46	240	12
47	245	12.25
48	250	12.5
49	255	12.75
50	260	13

Example 38: High-Throughput Screening Assay Identifying Changes in Small

Molecule Concentration and Membrane Permeability

Binding of a ligand to a receptor is known to alter intracellular levels of small molecules. such as calcium, potassium, sodium, and pH, as well as alter membrane potential. These alterations can be measured in an assay to identify supernatants which bind to receptors of a particular cell. Although the following protocol describes an assay for calcium, this protocol can easily be modified to detect changes in potassium, sodium, pH, membrane potential, or any other small molecule which is detectable by a fluorescent probe.

The following assay uses Fluorometric Imaging Plate Reader ("FLIPR") to measure changes in fluorescent molecules (Molecular Probes) that bind small molecules. Clearly, any fluorescent molecule detecting a small molecule can be used instead of the calcium fluorescent molecule, fluo-4 (Molecular Probes, Inc.; catalog no. F-14202), used here.

For adherent cells, seed the cells at 10,000 -20,000 cells/well in a Co-star black 96-well plate with clear bottom. The plate is incubated in a CO₂ incubator for 20 hours. The adherent cells are washed two times in Biotek washer with 200 ul of HBSS (Hank's Balanced Salt Solution) leaving 100 ul of buffer after the final wash.

A stock solution of 1 mg/ml fluo-4 is made in 10% pluronic acid DMSO. To load the cells with fluo-4 , 50 ul of 12 ug/ml fluo-4 is added to each well. The plate is incubated at 37 degrees C in a CO₂ incubator for 60 min. The plate is washed four times in the Biotek washer with HBSS leaving 100 ul of buffer.

For non-adherent cells, the cells are spun down from culture media. Cells are re-suspended to $2-5 \times 10^6$ cells/ml with HBSS in a 50-ml conical tube. 4 ul of 1 mg/ml fluo-4 solution in 10% pluronic acid DMSO is added to each ml of cell suspension. The tube is then placed in a 37 degrees C water bath for 30-60 min. The cells are washed twice with HBSS, resuspended to 1×10^6 cells/ml, and dispensed into a microplate. 100 ul/well. The plate is centrifuged at 1000 rpm for 5 min. The plate is then washed once in Denley Cell Wash with 200 ul, followed by an aspiration step to 100 ul final volume.

For a non-cell based assay, each well contains a fluorescent molecule, such as fluo-4. The supernatant is added to the well, and a change in fluorescence is detected.

To measure the fluorescence of intracellular calcium, the FLIPR is set for the following parameters: (1) System gain is 300-800 mW; (2) Exposure time is 0.4 second; (3) Camera F/stop is F/2; (4) Excitation is 488 nm; (5) Emission is 530 nm; and (6) Sample addition is 50 ul. Increased emission at 530 nm indicates an extracellular signaling event caused by the a molecule, either polypeptide of the present invention or a molecule induced by polypeptide of the present invention, which has resulted in an increase in the intracellular Ca^{++} concentration.

Example 40: High-Throughput Screening Assay Identifying Tyrosine Kinase Activity

The Protein Tyrosine Kinases (PTK) represent a diverse group of transmembrane and cytoplasmic kinases. Within the Receptor Protein Tyrosine Kinase (RPTK) group are receptors for a range of mitogenic and metabolic growth factors including the PDGF, FGF, EGF, NGF, HGF and Insulin receptor subfamilies. In addition there are a large family of RPTKs for which the corresponding ligand is unknown. Ligands for RPTKs include mainly secreted small proteins, but also membrane-bound and extracellular matrix proteins.

Activation of RPTK by ligands involves ligand-mediated receptor dimerization, resulting in transphosphorylation of the receptor subunits and activation of the cytoplasmic tyrosine kinases. The cytoplasmic tyrosine kinases include receptor associated tyrosine kinases of the src-family (e.g., src, yes, lck, lyn, fyn) and non-receptor linked and cytosolic protein tyrosine kinases, such as the Jak family, members of which mediate signal transduction triggered by the cytokine superfamily of receptors (e.g., the Interleukins, Interferons, GM-CSF, and Leptin).

Because of the wide range of known factors capable of stimulating tyrosine kinase activity, identifying whether polypeptide of the present invention or a molecule induced by polypeptide of the present invention is capable of activating tyrosine

kinase signal transduction pathways is of interest. Therefore, the following protocol is designed to identify such molecules capable of activating the tyrosine kinase signal transduction pathways.

Seed target cells (e.g., primary keratinocytes) at a density of approximately
5 25,000 cells per well in a 96 well Loprodyne Silent Screen Plates purchased from
Nalge Nunc (Naperville, IL). The plates are sterilized with two 30 minute rinses with
100% ethanol, rinsed with water and dried overnight. Some plates are coated for 2 hr
with 100 ml of cell culture grade type I collagen (50 mg/ml), gelatin (2%) or
polylysine (50 mg/ml), all of which can be purchased from Sigma Chemicals (St.
10 Louis, MO) or 10% Matrigel purchased from Becton Dickinson (Bedford, MA), or
calf serum, rinsed with PBS and stored at 4 degree C. Cell growth on these plates is
assayed by seeding 5,000 cells/well in growth medium and indirect quantitation of
cell number through use of alamarBlue as described by the manufacturer Alamar
Biosciences, Inc. (Sacramento, CA) after 48 hr. Falcon plate covers #3071 from
15 Becton Dickinson (Bedford, MA) are used to cover the Loprodyne Silent Screen
Plates. Falcon Microtest III cell culture plates can also be used in some proliferation
experiments.

To prepare extracts, A431 cells are seeded onto the nylon membranes of
Loprodyne plates (20,000/200ml/well) and cultured overnight in complete medium.
20 Cells are quiesced by incubation in serum-free basal medium for 24 hr. After 5-20
minutes treatment with EGF (60ng/ml) or 50 ul of the supernatant produced in
Example 31, the medium was removed and 100 ml of extraction buffer ((20 mM
HEPES pH 7.5, 0.15 M NaCl, 1% Triton X-100, 0.1% SDS, 2 mM Na₃VO₄, 2 mM
Na₄P₂O₇ and a cocktail of protease inhibitors (# 1836170) obtained from
25 Boehringer Mannheim (Indianapolis, IN) is added to each well and the plate is
shaken on a rotating shaker for 5 minutes at 4°C. The plate is then placed in a
vacuum transfer manifold and the extract filtered through the 0.45 mm membrane
bottoms of each well using house vacuum. Extracts are collected in a 96-well
catch/assay plate in the bottom of the vacuum manifold and immediately placed on
30 ice. To obtain extracts clarified by centrifugation, the content of each well, after

detergent solubilization for 5 minutes, is removed and centrifuged for 15 minutes at 4 degree C at 16,000 x g.

Test the filtered extracts for levels of tyrosine kinase activity. Although many methods of detecting tyrosine kinase activity are known, one method is described
5 here.

Generally, the tyrosine kinase activity of a supernatant is evaluated by determining its ability to phosphorylate a tyrosine residue on a specific substrate (a biotinylated peptide). Biotinylated peptides that can be used for this purpose include PSK1 (corresponding to amino acids 6-20 of the cell division kinase cdc2-p34) and
10 PSK2 (corresponding to amino acids 1-17 of gastrin). Both peptides are substrates for a range of tyrosine kinases and are available from Boehringer Mannheim.

The tyrosine kinase reaction is set up by adding the following components in order. First, add 10ul of 5uM Biotinylated Peptide, then 10ul ATP/Mg₂₊ (5mM ATP/50mM MgCl₂), then 10ul of 5x Assay Buffer (40mM imidazole hydrochloride,
15 pH7.3, 40 mM beta-glycerophosphate, 1mM EGTA, 100mM MgCl₂, 5 mM MnCl₂, 0.5 mg/ml BSA), then 5ul of Sodium Vanadate(1mM), and then 5ul of water. Mix the components gently and preincubate the reaction mix at 30 degree C for 2 min. Initiate the reaction by adding 10ul of the control enzyme or the filtered supernatant.

The tyrosine kinase assay reaction is then terminated by adding 10 ul of
20 120mM EDTA and place the reactions on ice.

Tyrosine kinase activity is determined by transferring 50 ul aliquot of reaction mixture to a microtiter plate (MTP) module and incubating at 37 degree C for 20 min. This allows the streptavidin coated 96 well plate to associate with the biotinylated peptide. Wash the MTP module with 300ul/well of PBS four times. Next add 75 ul
25 of anti-phosphotyrosine antibody conjugated to horse radish peroxidase(anti-P-Tyr-POD(0.5u/ml)) to each well and incubate at 37 degree C for one hour. Wash the well as above.

Next add 100ul of peroxidase substrate solution (Boehringer Mannheim) and incubate at room temperature for at least 5 mins (up to 30 min). Measure the
30 absorbance of the sample at 405 nm by using ELISA reader. The level of bound

peroxidase activity is quantitated using an ELISA reader and reflects the level of tyrosine kinase activity.

Example 41: High-Throughput Screening Assay Identifying Phosphorylation Activity

5

As a potential alternative and/or compliment to the assay of protein tyrosine kinase activity described in Example 40, an assay which detects activation (phosphorylation) of major intracellular signal transduction intermediates can also be used. For example, as described below one particular assay can detect tyrosine phosphorylation of the Erk-1 and Erk-2 kinases. However, phosphorylation of other molecules, such as Raf, JNK, p38 MAP, Map kinase kinase (MEK), MEK kinase, Src, Muscle specific kinase (MuSK), IRAK, Tec, and Janus, as well as any other phosphoserine, phosphotyrosine, or phosphothreonine molecule, can be detected by substituting these molecules for Erk-1 or Erk-2 in the following assay.

15

Specifically, assay plates are made by coating the wells of a 96-well ELISA plate with 0.1ml of protein G (1ug/ml) for 2 hr at room temp, (RT). The plates are then rinsed with PBS and blocked with 3% BSA/PBS for 1 hr at RT. The protein G plates are then treated with 2 commercial monoclonal antibodies (100ng/well) against Erk-1 and Erk-2 (1 hr at RT) (Santa Cruz Biotechnology). (To detect other molecules, this step can easily be modified by substituting a monoclonal antibody detecting any of the above described molecules.) After 3-5 rinses with PBS, the plates are stored at 4 degree C until use.

20

A431 cells are seeded at 20,000/well in a 96-well Loprodyne filterplate and cultured overnight in growth medium. The cells are then starved for 48 hr in basal medium (DMEM) and then treated with EGF (6ng/well) or 50 ul of the supernatants obtained in Example 31 for 5-20 minutes. The cells are then solubilized and extracts filtered directly into the assay plate.

25

After incubation with the extract for 1 hr at RT, the wells are again rinsed. As a positive control, a commercial preparation of MAP kinase (10ng/well) is used in place of A431 extract. Plates are then treated with a commercial polyclonal (rabbit)

30

antibody (1 µg/ml) which specifically recognizes the phosphorylated epitope of the Erk-1 and Erk-2 kinases (1 hr at RT). This antibody is biotinylated by standard procedures. The bound polyclonal antibody is then quantitated by successive incubations with Europium-streptavidin and Europium fluorescence enhancing
5 reagent in the Wallac DELFIA instrument (time-resolved fluorescence). An increased fluorescent signal over background indicates a phosphorylation by polypeptide of the present invention or a molecule induced by polypeptide of the present invention.

Example 42: Assay for the Stimulation of Bone Marrow CD34+ Cell Proliferation

10

This assay is based on the ability of human CD34+ to proliferate in the presence of hematopoietic growth factors and evaluates the ability of isolated polypeptides expressed in mammalian cells to stimulate proliferation of CD34+ cells.

It has been previously shown that most mature precursors will respond to only
15 a single signal. More immature precursors require at least two signals to respond. Therefore, to test the effect of polypeptides on hematopoietic activity of a wide range of progenitor cells, the assay contains a given polypeptide in the presence or absence of other hematopoietic growth factors. Isolated cells are cultured for 5 days in the presence of Stem Cell Factor (SCF) in combination with tested sample. SCF alone
20 has a very limited effect on the proliferation of bone marrow (BM) cells, acting in such conditions only as a "survival" factor. However, combined with any factor exhibiting stimulatory effect on these cells (e.g., IL-3), SCF will cause a synergistic effect. Therefore, if the tested polypeptide has a stimulatory effect on a hematopoietic progenitors, such activity can be easily detected. Since normal BM cells have a low
25 level of cycling cells, it is likely that any inhibitory effect of a given polypeptide, or agonists or antagonists thereof, might not be detected. Accordingly, assays for an inhibitory effect on progenitors is preferably tested in cells that are first subjected to *in vitro* stimulation with SCF+IL+3, and then contacted with the compound that is being evaluated for inhibition of such induced proliferation.

30

Briefly, CD34+ cells are isolated using methods known in the art. The cells

are thawed and resuspended in medium (QBSF 60 serum-free medium with 1% L-glutamine (500ml) Quality Biological, Inc., Gaithersburg, MD Cat# 160-204-101). After several gentle centrifugation steps at 200 x g, cells are allowed to rest for one hour. The cell count is adjusted to 2.5×10^5 cells/ml. During this time, 100 μ l of
5 sterile water is added to the peripheral wells of a 96-well plate. The cytokines that can be tested with a given polypeptide in this assay is rhSCF (R&D Systems, Minneapolis, MN, Cat# 255-SC) at 50 ng/ml alone and in combination with rhSCF and rhIL-3 (R&D Systems, Minneapolis, MN, Cat# 203-ML) at 30 ng/ml. After one hour, 10 μ l of prepared cytokines, 50 μ l of the supernatants prepared in Example 31
10 (supernatants at 1:2 dilution = 50 μ l) and 20 μ l of diluted cells are added to the media which is already present in the wells to allow for a final total volume of 100 μ l. The plates are then placed in a 37°C/5% CO₂ incubator for five days.

Eighteen hours before the assay is harvested, 0.5 μ Ci/well of [3H] Thymidine is added in a 10 μ l volume to each well to determine the proliferation rate. The
15 experiment is terminated by harvesting the cells from each 96-well plate to a filtermat using the Tomtec Harvester 96. After harvesting, the filtermats are dried, trimmed and placed into OmniFilter assemblies consisting of one OmniFilter plate and one OmniFilter Tray. 60 μ l Microscint is added to each well and the plate sealed with TopSeal-A press-on sealing film. A bar code 15 sticker is affixed to the first plate for
20 counting. The sealed plates is then loaded and the level of radioactivity determined via the Packard Top Count and the printed data collected for analysis. The level of radioactivity reflects the amount of cell proliferation.

The studies described in this example test the activity of a given polypeptide to stimulate bone marrow CD34+ cell proliferation. One skilled in the art could
25 easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or antagonists and fragments and variants thereof. As a nonlimiting example, potential antagonists tested in this assay would be expected to inhibit cell proliferation in the presence of cytokines and/or to increase the inhibition of cell proliferation in the presence of cytokines and a given polypeptide.
30 In contrast, potential agonists tested in this assay would be expected to enhance cell

proliferation and/or to decrease the inhibition of cell proliferation in the presence of cytokines and a given polypeptide.

The ability of a gene to stimulate the proliferation of bone marrow CD34+ cells indicates that polynucleotides and polypeptides corresponding to the gene are
5 useful for the diagnosis and treatment of disorders affecting the immune system and hematopoiesis. Representative uses are described in the "Immune Activity" and "Infectious Disease" sections above, and elsewhere herein.

Example 43: Assay for Extracellular Matrix Enhanced Cell Response (EMECR)

10

The objective of the Extracellular Matrix Enhanced Cell Response (EMECR) assay is to identify gene products (e.g., isolated polypeptides) that act on the hematopoietic stem cells in the context of the extracellular matrix (ECM) induced signal.

15 Cells respond to the regulatory factors in the context of signal(s) received from the surrounding microenvironment. For example, fibroblasts, and endothelial and epithelial stem cells fail to replicate in the absence of signals from the ECM. Hematopoietic stem cells can undergo self-renewal in the bone marrow, but not in *in vitro* suspension culture. The ability of stem cells to undergo self-renewal *in vitro* is
20 dependent upon their interaction with the stromal cells and the ECM protein fibronectin (fn). Adhesion of cells to fn is mediated by the $\alpha_5\beta_1$ and $\alpha_4\beta_1$ integrin receptors, which are expressed by human and mouse hematopoietic stem cells. The factor(s) which integrate with the ECM environment and responsible for stimulating stem cell self-renewal has not yet been identified. Discovery of such factors should
25 be of great interest in gene therapy and bone marrow transplant applications

Briefly, polystyrene, non tissue culture treated, 96-well plates are coated with fn fragment at a coating concentration of $0.2 \mu\text{g}/\text{cm}^2$. Mouse bone marrow cells are plated (1,000 cells/well) in 0.2 ml of serum-free medium. Cells cultured in the presence of IL-3 (5 ng/ml) + SCF (50 ng/ml) would serve as the positive control,

conditions under which little self-renewal but pronounced differentiation of the stem cells is to be expected. Gene products of the invention (e.g., including, but not limited to, polynucleotides and polypeptides of the present invention, and supernatants produced in Example 31), are tested with appropriate negative controls in the presence and absence of SCF(5.0 ng/ml), where test factor supernates represent 10% of the total assay volume. The plated cells are then allowed to grow by incubating in a low oxygen environment (5% CO₂, 7% O₂, and 88% N₂) tissue culture incubator for 7 days. The number of proliferating cells within the wells is then quantitated by measuring thymidine incorporation into cellular DNA. Verification of the positive hits in the assay will require phenotypic characterization of the cells, which can be accomplished by scaling up of the culture system and using appropriate antibody reagents against cell surface antigens and FACScan.

One skilled in the art could easily modify the exemplified studies to test the activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or antagonists and fragments and variants thereof.

If a particular polypeptide of the present invention is found to be a stimulator of hematopoietic progenitors, polynucleotides and polypeptides corresponding to the gene encoding said polypeptide may be useful for the diagnosis and treatment of disorders affecting the immune system and hematopoiesis. Representative uses are described in the "Immune Activity" and "Infectious Disease" sections above, and elsewhere herein. The gene product may also be useful in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types.

Additionally, the polynucleotides and/or polypeptides of the gene of interest and/or agonists and/or antagonists thereof, may also be employed to inhibit the proliferation and differentiation of hematopoietic cells and therefore may be employed to protect bone marrow stem cells from chemotherapeutic agents during chemotherapy. This antiproliferative effect may allow administration of higher doses of chemotherapeutic agents and, therefore, more effective chemotherapeutic treatment.

Moreover, polynucleotides and polypeptides corresponding to the gene of interest may also be useful for the treatment and diagnosis of hematopoietic related disorders such as, for example, anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia.

Example 44: Human Dermal Fibroblast and Aortic Smooth Muscle Cell Proliferation

10

The polypeptide of interest is added to cultures of normal human dermal fibroblasts (NHDF) and human aortic smooth muscle cells (AoSMC) and two co-assays are performed with each sample. The first assay examines the effect of the polypeptide of interest on the proliferation of normal human dermal fibroblasts (NHDF) or aortic smooth muscle cells (AoSMC). Aberrant growth of fibroblasts or smooth muscle cells is a part of several pathological processes, including fibrosis, and restenosis. The second assay examines IL6 production by both NHDF and SMC. IL6 production is an indication of functional activation. Activated cells will have increased production of a number of cytokines and other factors, which can result in a proinflammatory or immunomodulatory outcome. Assays are run with and without co-TNF α stimulation, in order to check for costimulatory or inhibitory activity.

Briefly, on day 1, 96-well black plates are set up with 1000 cells/well (NHDF) or 2000 cells/well (AoSMC) in 100 μ l culture media. NHDF culture media contains: Clonetics FB basal media, 1mg/ml hFGF, 5mg/ml insulin, 50mg/ml gentamycin, 2%FBS, while AoSMC culture media contains Clonetics SM basal media, 0.5 μ g/ml hEGF, 5mg/ml insulin, 1 μ g/ml hFGF, 50mg/ml gentamycin, 50 μ g/ml Amphotericin B, 5%FBS. After incubation at 37°C for at least 4-5 hours, culture media is aspirated and replaced with growth arrest media. Growth arrest media for NHDF contains fibroblast basal media, 50mg/ml gentamycin, 2% FBS, while growth arrest media for AoSMC contains SM basal media, 50mg/ml gentamycin, 50 μ g/ml Amphotericin B,

30

0.4% FBS. Incubate at 37°C until day 2.

On day 2, serial dilutions and templates of the polypeptide of interest are designed such that they always include media controls and known-protein controls. For both stimulation and inhibition experiments, proteins are diluted in growth arrest
5 media. For inhibition experiments, TNFa is added to a final concentration of 2ng/ml (NHDF) or 5ng/ml (AoSMC). Add 1/3 vol media containing controls or polypeptides of the present invention and incubate at 37°C/5% CO₂ until day 5.

Transfer 60µl from each well to another labeled 96-well plate, cover with a plate-sealer, and store at 4°C until Day 6 (for IL6 ELISA). To the remaining 100 µl in
10 the cell culture plate, aseptically add Alamar Blue in an amount equal to 10% of the culture volume (10µl). Return plates to incubator for 3 to 4 hours. Then measure fluorescence with excitation at 530nm and emission at 590nm using the CytoFluor. This yields the growth stimulation/inhibition data.

On day 5, the IL6 ELISA is performed by coating a 96 well plate with 50-100
15 µl/well of Anti-Human IL6 Monoclonal antibody diluted in PBS, pH 7.4, incubate ON at room temperature.

On day 6, empty the plates into the sink and blot on paper towels. Prepare Assay Buffer containing PBS with 4% BSA. Block the plates with 200 µl/well of Pierce Super Block blocking buffer in PBS for 1-2 hr and then wash plates with wash
20 buffer (PBS, 0.05% Tween-20). Blot plates on paper towels. Then add 50 µl/well of diluted Anti-Human IL-6 Monoclonal, Biotin-labeled antibody at 0.50 mg/ml. Make dilutions of IL-6 stock in media (30, 10, 3, 1, 0.3, 0 ng/ml). Add duplicate samples to top row of plate. Cover the plates and incubate for 2 hours at RT on shaker. Plates are washed with wash buffer and blotted on paper towels. Dilute EU-labeled Streptavidin
25 1:1000 in Assay buffer, and add 100 µl/well. Cover the plate and incubate 1 h at RT. Plates are again washed with wash buffer and blotted on paper towels. Add 100 µl/well of Enhancement Solution and shake for 5 minutes. Read the plate on the Wallac DELFIA Fluorometer. Readings from triplicate samples in each assay are tabulated and averaged.

30 A positive result in this assay suggests AoSMC cell proliferation and that the

polypeptide of the present invention may be involved in dermal fibroblast proliferation and/or smooth muscle cell proliferation. A positive result also suggests many potential uses of polypeptides, polynucleotides, agonists and/or antagonists of the polynucleotide/polypeptide of the present invention which gives a positive result.

5 For example, inflammation and immune responses, wound healing, and angiogenesis, as detailed throughout this specification. Particularly, polypeptides of the present invention and polynucleotides of the present invention may be used in wound healing and dermal regeneration, as well as the promotion of vasculargenesis, both of the blood vessels and lymphatics. The growth of vessels can be used in the treatment of,

10 for example, cardiovascular diseases. Additionally, antagonists of polypeptides and polynucleotides of the invention may be useful in treating diseases, disorders, and/or conditions which involve angiogenesis by acting as an anti-vascular (e.g., anti-angiogenesis). These diseases, disorders, and/or conditions are known in the art and/or are described herein, such as, for example, malignancies, solid tumors, benign

15 tumors, for example hemangiomas, acoustic neuromas, neurofibromas, trachomas, and pyogenic granulomas; atherosclerotic plaques; ocular angiogenic diseases, for example, diabetic retinopathy, retinopathy of prematurity, macular degeneration, corneal graft rejection, neovascular glaucoma, retrolental fibroplasia, rubeosis, retinoblastoma, uveitis and Pterygia (abnormal blood vessel growth) of the eye;

20 rheumatoid arthritis; psoriasis; delayed wound healing; endometriosis; vasculogenesis; granulations; hypertrophic scars (keloids); nonunion fractures; scleroderma; trachoma; vascular adhesions; myocardial angiogenesis; coronary collaterals; cerebral collaterals; arteriovenous malformations; ischemic limb angiogenesis; Osler-Webber Syndrome; plaque neovascularization; telangiectasia;

25 hemophiliac joints; angiofibroma; fibromuscular dysplasia; wound granulation; Crohn's disease; and atherosclerosis. Moreover, antagonists of polypeptides and polynucleotides of the invention may be useful in treating anti-hyperproliferative diseases and/or anti-inflammatory known in the art and/or described herein.

One skilled in the art could easily modify the exemplified studies to test the

30 activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or

antagonists and fragments and variants thereof.

Example 45: Cellular Adhesion Molecule (CAM) Expression on Endothelial Cells

5

The recruitment of lymphocytes to areas of inflammation and angiogenesis involves specific receptor-ligand interactions between cell surface adhesion molecules (CAMs) on lymphocytes and the vascular endothelium. The adhesion process, in both normal and pathological settings, follows a multi-step cascade that involves intercellular adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule-1 (VCAM-1), and endothelial leukocyte adhesion molecule-1 (E-selectin) expression on endothelial cells (EC). The expression of these molecules and others on the vascular endothelium determines the efficiency with which leukocytes may adhere to the local vasculature and extravasate into the local tissue during the development of an inflammatory response. The local concentration of cytokines and growth factor participate in the modulation of the expression of these CAMs.

Briefly, endothelial cells (e.g., Human Umbilical Vein Endothelial cells (HUVECs)) are grown in a standard 96 well plate to confluence, growth medium is removed from the cells and replaced with 100 μ l of 199 Medium (10% fetal bovine serum (FBS)). Samples for testing and positive or negative controls are added to the plate in triplicate (in 10 μ l volumes). Plates are then incubated at 37°C for either 5 h (selectin and integrin expression) or 24 h (integrin expression only). Plates are aspirated to remove medium and 100 μ l of 0.1% paraformaldehyde-PBS(with Ca⁺⁺ and Mg⁺⁺) is added to each well. Plates are held at 4°C for 30 min. Fixative is removed from the wells and wells are washed 1X with PBS(+Ca,Mg) + 0.5% BSA and drained. 10 μ l of diluted primary antibody is added to the test and control wells. Anti-ICAM-1-Biotin, Anti-VCAM-1-Biotin and Anti-E-selectin-Biotin are used at a concentration of 10 μ g/ml (1:10 dilution of 0.1 mg/ml stock antibody). Cells are incubated at 37°C for 30 min. in a humidified environment. Wells are washed three times with PBS(+Ca,Mg) + 0.5% BSA. 20 μ l of diluted ExtrAvidin-Alkaline

Phosphatase (1:5,000 dilution, referred to herein as the working dilution) are added to each well and incubated at 37°C for 30 min. Wells are washed three times with PBS(+Ca,Mg)+0.5% BSA. Dissolve 1 tablet of p-Nitrophenol Phosphate pNPP per 5 ml of glycine buffer (pH 10.4). 100 µl of pNPP substrate in glycine buffer is added to each test well. Standard wells in triplicate are prepared from the working dilution of the ExtrAvidin-Alkaline Phosphatase in glycine buffer: 1:5,000 (10^0) > $10^{-0.5}$ > 10^{-1} > $10^{-1.5}$. 5 µl of each dilution is added to triplicate wells and the resulting AP content in each well is 5.50 ng, 1.74 ng, 0.55 ng, 0.18 ng. 100 µl of pNPP reagent is then added to each of the standard wells. The plate is incubated at 37°C for 4h. A volume of 50 µl of 3M NaOH is added to all wells. The plate is read on a plate reader at 405 nm using the background subtraction option on blank wells filled with glycine buffer only. Additionally, the template is set up to indicate the concentration of AP-conjugate in each standard well [5.50 ng; 1.74 ng; 0.55 ng; 0.18 ng]. Results are indicated as amount of bound AP-conjugate in each sample.

Example 46: Alamar Blue Endothelial Cells Proliferation Assay

This assay may be used to quantitatively determine protein mediated inhibition of bFGF-induced proliferation of Bovine Lymphatic Endothelial Cells (LECs), Bovine Aortic Endothelial Cells (BAECs) or Human Microvascular Uterine Myometrial Cells (UTMECs). This assay incorporates a fluorometric growth indicator based on detection of metabolic activity. A standard Alamar Blue Proliferation Assay is prepared in EGM-2MV with 10 ng /ml of bFGF added as a source of endothelial cell stimulation. This assay may be used with a variety of endothelial cells with slight changes in growth medium and cell concentration. Dilutions of the protein batches to be tested are diluted as appropriate. Serum-free medium (GIBCO SFM) without bFGF is used as a non-stimulated control and Angiostatin or TSP-1 are included as a known inhibitory controls.

Briefly, LEC, BAECs or UTMECs are seeded in growth media at a density of 5000 to 2000 cells/well in a 96 well plate and placed at 37-C overnight. After the

overnight incubation of the cells, the growth media is removed and replaced with GIBCO EC-SFM. The cells are treated with the appropriate dilutions of the protein of interest or control protein sample(s) (prepared in SFM) in triplicate wells with additional bFGF to a concentration of 10 ng/ ml. Once the cells have been treated
5 with the samples, the plate(s) is/are placed back in the 37° C incubator for three days. After three days 10 ml of stock alamar blue (Biosource Cat# DAL1100) is added to each well and the plate(s) is/are placed back in the 37°C incubator for four hours. The plate(s) are then read at 530nm excitation and 590nm emission using the CytoFluor fluorescence reader. Direct output is recorded in relative fluorescence units.

10 Alamar blue is an oxidation-reduction indicator that both fluoresces and changes color in response to chemical reduction of growth medium resulting from cell growth. As cells grow in culture, innate metabolic activity results in a chemical reduction of the immediate surrounding environment. Reduction related to growth causes the indicator to change from oxidized (non-fluorescent blue) form to reduced
15 (fluorescent red) form. i.e. stimulated proliferation will produce a stronger signal and inhibited proliferation will produce a weaker signal and the total signal is proportional to the total number of cells as well as their metabolic activity. The background level of activity is observed with the starvation medium alone. This is compared to the output observed from the positive control samples (bFGF in growth medium) and
20 protein dilutions.

Example 47: Detection of Inhibition of a Mixed Lymphocyte Reaction

25 This assay can be used to detect and evaluate inhibition of a Mixed Lymphocyte Reaction (MLR) by gene products (e.g., isolated polypeptides). Inhibition of a MLR may be due to a direct effect on cell proliferation and viability, modulation of costimulatory molecules on interacting cells, modulation of adhesiveness between lymphocytes and accessory cells, or modulation of cytokine production by accessory cells. Multiple cells may be targeted by these polypeptides

since the peripheral blood mononuclear fraction used in this assay includes T, B and natural killer lymphocytes, as well as monocytes and dendritic cells.

Polypeptides of interest found to inhibit the MLR may find application in diseases associated with lymphocyte and monocyte activation or proliferation. These
5 include, but are not limited to, diseases such as asthma, arthritis, diabetes, inflammatory skin conditions, psoriasis, eczema, systemic lupus erythematosus, multiple sclerosis, glomerulonephritis, inflammatory bowel disease, crohn's disease, ulcerative colitis, arteriosclerosis, cirrhosis, graft vs. host disease, host vs. graft disease, hepatitis, leukemia and lymphoma.

10 Briefly, PBMCs from human donors are purified by density gradient centrifugation using Lymphocyte Separation Medium (LSM®, density 1.0770 g/ml, Organon Teknika Corporation, West Chester, PA). PBMCs from two donors are adjusted to 2×10^6 cells/ml in RPMI-1640 (Life Technologies, Grand Island, NY) supplemented with 10% FCS and 2 mM glutamine. PBMCs from a third donor is
15 adjusted to 2×10^5 cells/ml. Fifty microliters of PBMCs from each donor is added to wells of a 96-well round bottom microtiter plate. Dilutions of test materials (50 μ l) is added in triplicate to microtiter wells. Test samples (of the protein of interest) are added for final dilution of 1:4; rhIL-2 (R&D Systems, Minneapolis, MN, catalog number 202-IL) is added to a final concentration of 1 μ g/ml; anti-CD4 mAb (R&D
20 Systems, clone 34930.11, catalog number MAB379) is added to a final concentration of 10 μ g/ml. Cells are cultured for 7-8 days at 37°C in 5% CO₂, and 1 μ C of [³H] thymidine is added to wells for the last 16 hrs of culture. Cells are harvested and thymidine incorporation determined using a Packard TopCount. Data is expressed as the mean and standard deviation of triplicate determinations.

25 Samples of the protein of interest are screened in separate experiments and compared to the negative control treatment, anti-CD4 mAb, which inhibits proliferation of lymphocytes and the positive control treatment, IL-2 (either as recombinant material or supernatant), which enhances proliferation of lymphocytes.

One skilled in the art could easily modify the exemplified studies to test the
30 activity of polynucleotides (e.g., gene therapy), antibodies, agonists, and/or

antagonists and fragments and variants thereof.

It will be clear that the invention may be practiced otherwise than as particularly described in the foregoing description and examples. Numerous modifications and variations of the present invention are possible in light of the above teachings and, therefore, are within the scope of the appended claims.

The entire disclosure of each document cited (including patents, patent applications, journal articles, abstracts, laboratory manuals, books, or other disclosures) in the Background of the Invention, Detailed Description, and Examples is hereby incorporated herein by reference. Further, the hard copy of the sequence listing submitted herewith and the corresponding computer readable form are both incorporated herein by reference in their entireties. Moreover, the hard copy of and the corresponding computer readable form of the Sequence Listing of Serial No. 60/124,270 are also incorporated herein by reference in their entireties.

539

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209059
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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Authorized officer Janet Powell PCT/Intell. Appl. Processing Div. (703) 305-3389	Authorized officer

ATCC Deposit No. 209059**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

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Page 2

ATCC Deposit No. 209059

DENMARK

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SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

542

Applicant's or agent's file
reference number

PA106PCT

International application?

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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution <u>American Type Culture Collection</u>	
Address of depositary institution (including postal code and country) <u>10801 University Boulevard</u> <u>Manassas, Virginia 20110-2209</u> <u>United States of America</u>	
Date of deposit <u>20 May 1997</u>	Accession Number <u>209060</u>
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
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ATCC Deposit No. 209060**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 209060

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

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NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

545

Applicant's or agent's file reference number	PA106PCT	International application No.	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209061
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
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ATCC Deposit No. 209061**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

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UNITED KINGDOM

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Page 2

ATCC Deposit No. 209061

DENMARK

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SWEDEN

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NETHERLANDS

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548

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209062
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. 209062**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

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UNITED KINGDOM

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Page 2**ATCC Deposit No. 209062****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

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NETHERLANDS

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551

Applicant's or agent's file reference number	PA106PCT	International application?	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209063
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. 209063**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. 209063****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

554

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209064
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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<input checked="" type="checkbox"/> This sheet was received with the international application	<input type="checkbox"/> This sheet was received by the International Bureau on:
Authorized officer PCT/Internal Legal Processing Div. (703) 305-3339	Authorized officer

ATCC Deposit No. 209064**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 209064

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

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NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209065
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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Authorized officer PCT/US00/05882 Processing Div. (703) 305-3639	Authorized officer

ATCC Deposit No. 209065**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. 209065****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

560

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209066
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. 209066**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 209066

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

563

Applicant's or agent's file reference number	PA106PCT	International application?	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209067
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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Authorized officer Patent Processing Div. (703) 303-6039

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ATCC Deposit No. 209067**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. 209067****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

566

Applicant's or agent's file reference number	PA106PCT	International application?	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209068
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

<p>For receiving Office use only</p> <p><input checked="" type="checkbox"/> This sheet was received with the international application</p> <p>Authorized officer: PCT/International Appl Processing Div. (703) 365-6639</p>	<p>For International Bureau use only</p> <p><input type="checkbox"/> This sheet was received by the International Bureau on:</p> <p>Authorized officer</p>
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ATCC Deposit No. 209068**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

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AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 209068

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

569

Applicant's or agent's file
reference number

PA106PCT

International application?

UNASSIGNED

INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 20 May 1997	Accession Number 209069
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

<input checked="" type="checkbox"/> For receiving Office use only This sheet was received with the international application Jan 17/97 Date Authorized officer PCT/Internat. Appl. Processing Div. (703) 305-3639	<input type="checkbox"/> For International Bureau use only This sheet was received by the International Bureau on: Authorized officer
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ATCC Deposit No. 209069**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 209069

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

572

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 12 January 1998	Accession Number 209579
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

For receiving Office use only	For International Bureau use only
<input checked="" type="checkbox"/> This sheet was received with the international application	<input type="checkbox"/> This sheet was received by the International Bureau on:
Authorized officer Jared A. Powell PCT/Internat'l Appl Processing Div. (703) 305-3639	Authorized officer

ATCC Deposit No. 209579**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. 209579****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

575

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 12 January 1998	Accession Number 209578
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

For receiving Office use only	For International Bureau use only
<input checked="" type="checkbox"/> This sheet was received with the international application	<input type="checkbox"/> This sheet was received by the International Bureau on:
Authorized officer Jery McCall PCT/International Appl Processing Div. (703) 605-6000	Authorized officer

ATCC Deposit No. 209578**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 209578

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

578

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 16 July 1998	Accession Number 203067
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

For receiving Office use only	For International Bureau use only
<input checked="" type="checkbox"/> This sheet was received with the international application	<input type="checkbox"/> This sheet was received by the International Bureau on:
Authorized officer Daryl McDowell PCT/International Appl Processing Div. (703) 305-6669	Authorized officer

ATCC Deposit No. 203067**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

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FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 203067

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

581

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 16 July 1998	Accession Number 203068
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States). Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable) The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

<p>For receiving Office use only</p> <p><input checked="" type="checkbox"/> This sheet was received with the international application</p> <p>Authorized officer Jerald McBowell PCT/International Appl Processing Div. (703) 305-3339</p>	<p>For International Bureau use only</p> <p><input type="checkbox"/> This sheet was received by the International Bureau on:</p> <p>Authorized officer</p>
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ATCC Deposit No. 203068**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 203068

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

584

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 1 February 1999	Accession Number 203609
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

For receiving Office use only <input checked="" type="checkbox"/> This sheet was received with the international application Jeryl McDowell Authorized officer PCT/Internat'l Appl Processing Div. (703) 305-3339	For International Bureau use only <input type="checkbox"/> This sheet was received by the International Bureau on: Authorized officer
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ATCC Deposit No. 203609**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. 203609

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

587

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution <u>American Type Culture Collection</u>	
Address of depositary institution (including postal code and country) <u>10801 University Boulevard</u> <u>Manassas, Virginia 20110-2209</u> <u>United States of America</u>	
Date of deposit <u>1 February 1999</u>	Accession Number <u>203610</u>
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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Jeryl McEwell Authorized officer PCT/International Appl Processing Div. (703) 305-5539	Authorized officer

ATCC Deposit No. 203610**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. 203610****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

590

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 17 November 1998	Accession Number 203485
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. 203485**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. 203485****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

593

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> . line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 18 June 1999	Accession Number PTA-252
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. PTA-252**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. PTA-252

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

596

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 18 June 1999	Accession Number PTA-253
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. PTA-253**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2**ATCC Deposit No. PTA-253****DENMARK**

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

599

Applicant's or agent's file reference number	PA106PCT	International application	UNASSIGNED
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM

(PCT Rule 13bis)

A. The indications made below relate to the microorganism referred to in the description on page <u>121</u> , line <u>N/A</u>	
B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet <input type="checkbox"/>	
Name of depositary institution American Type Culture Collection	
Address of depositary institution (including postal code and country) 10801 University Boulevard Manassas, Virginia 20110-2209 United States of America	
Date of deposit 22 December 1999	Accession Number PTA-1081
C. ADDITIONAL INDICATIONS (leave blank if not applicable) This information is continued on an additional sheet <input type="checkbox"/>	
D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE (if the indications are not for all designated States)	
Europe In respect to those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28 (4) EPC).	
E. SEPARATE FURNISHING OF INDICATIONS (leave blank if not applicable)	
The indications listed below will be submitted to the International Bureau later (specify the general nature of the indications e.g., "Accession Number of Deposit")	

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ATCC Deposit No. PTA-1081**CANADA**

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

Page 2

ATCC Deposit No. PTA-1081

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.

What Is Claimed Is:

1. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 95% identical to a sequence selected from the group consisting of:
- 5
- (a) a polynucleotide fragment of SEQ ID NO:X or a polynucleotide fragment of the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X;
 - (b) a polynucleotide encoding a polypeptide fragment of SEQ ID NO:Y or a polypeptide fragment encoded by the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X;
 - 10 (c) a polynucleotide encoding a polypeptide fragment of a polypeptide encoded by SEQ ID NO:X or a polypeptide fragment encoded by the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X;
 - 15 (d) a polynucleotide encoding a polypeptide domain of SEQ ID NO:Y or a polypeptide domain encoded by the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X;
 - (e) a polynucleotide encoding a polypeptide epitope of SEQ ID NO:Y or a polypeptide epitope encoded by the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X;
 - 20 (f) a polynucleotide encoding a polypeptide of SEQ ID NO:Y or the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X, having biological activity;
 - (g) a polynucleotide which is a variant of SEQ ID NO:X;
 - 25 (h) a polynucleotide which is an allelic variant of SEQ ID NO:X;
 - (i) a polynucleotide which encodes a species homologue of the SEQ ID NO:Y;
 - (j) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(i), wherein said polynucleotide does not hybridize under stringent conditions to a nucleic acid molecule having a nucleotide
 - 30

sequence of only A residues or of only T residues.

2. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding a protein.

5

3. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises a nucleotide sequence encoding the sequence identified as SEQ ID NO:Y or the polypeptide encoded by the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X.

10

4. The isolated nucleic acid molecule of claim 1, wherein the polynucleotide fragment comprises the entire nucleotide sequence of SEQ ID NO:X or the cDNA sequence included in the related cDNA clone, which is hybridizable to SEQ ID NO:X.

15

5. The isolated nucleic acid molecule of claim 2, wherein the nucleotide sequence comprises sequential nucleotide deletions from either the C-terminus or the N-terminus.

20

6. The isolated nucleic acid molecule of claim 3, wherein the nucleotide sequence comprises sequential nucleotide deletions from either the C-terminus or the N-terminus.

25

7. A recombinant vector comprising the isolated nucleic acid molecule of claim 1.

8. A method of making a recombinant host cell comprising the isolated nucleic acid molecule of claim 1.

30

9. A recombinant host cell produced by the method of claim 8.

10. The recombinant host cell of claim 9 comprising vector sequences.
11. An isolated polypeptide comprising an amino acid sequence at least
5 95% identical to a sequence selected from the group consisting of:
- (a) a polypeptide fragment of SEQ ID NO:Y or of the sequence encoded by the cDNA included in the related cDNA clone;
 - (b) a polypeptide fragment of SEQ ID NO:Y or of the sequence encoded by the cDNA included in the related cDNA clone, having biological activity;
 - 10 (c) a polypeptide domain of SEQ ID NO:Y or of the sequence encoded by the cDNA included in the related cDNA clone;
 - (d) a polypeptide epitope of SEQ ID NO:Y or of the sequence encoded by the cDNA included in the related cDNA clone;
 - (e) a full length protein of SEQ ID NO:Y or of the sequence encoded by the
15 cDNA included in the related cDNA clone;
 - (f) a variant of SEQ ID NO:Y;
 - (g) an allelic variant of SEQ ID NO:Y; or
 - (h) a species homologue of the SEQ ID NO:Y.
12. The isolated polypeptide of claim 11, wherein the full length protein comprises sequential amino acid deletions from either the C-terminus or the N-terminus.
13. An isolated antibody that binds specifically to the isolated polypeptide
25 of claim 11.
14. A recombinant host cell that expresses the isolated polypeptide of claim 11.
15. A method of making an isolated polypeptide comprising:
- 30

(a) culturing the recombinant host cell of claim 14 under conditions such that said polypeptide is expressed; and

(b) recovering said polypeptide.

5 16. The polypeptide produced by claim 15.

17. A method for preventing, treating, or ameliorating a medical condition, comprising administering to a mammalian subject a therapeutically effective amount of the polypeptide of claim 11 or the polynucleotide of claim 1.

10

18. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:

(a) determining the presence or absence of a mutation in the polynucleotide of claim 1; and

15 (b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or absence of said mutation.

19. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:

20 (a) determining the presence or amount of expression of the polypeptide of claim 11 in a biological sample; and

(b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or amount of expression of the polypeptide.

25 20. A method for identifying a binding partner to the polypeptide of claim 11 comprising:

(a) contacting the polypeptide of claim 11 with a binding partner; and

(b) determining whether the binding partner effects an activity of the polypeptide.

30

21. The gene corresponding to the cDNA sequence of SEQ ID NO:Y.
22. A method of identifying an activity in a biological assay, wherein the method comprises:
- 5 (a) expressing SEQ ID NO:X in a cell;
- (b) isolating the supernatant;
- (c) detecting an activity in a biological assay; and
- (d) identifying the protein in the supernatant having the activity.
23. The product produced by the method of claim 20.
- 20

SEQUENCE LISTING

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<212> DNA

<213> Homo sapiens

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<222> (846)

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<222> (1517)

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<222> (2110)

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<211> 1117

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<213> Homo sapiens

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 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (869)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (884)
 <223> n equals a,t,g, or c

<400> 14
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 ctggagggtgc tgggggtgctc tgtggcccct gtctacagct actacgcaca gaatgagggtg 120
 gtggccaccg atgacctgga tttccggcac cacagctaca aggacatgcg ccagctcatg 180
 aagggtggtga acgaggagtg cccaccatc acccgcaactt acagcctggg caagagctca 240
 cgaggcctca agatctatgc catggagatc tcagacaacc ctggggagca tgaactgggg 300
 gagcccgagt tccgctacac tgctgggatc catggcaacg aggtgctggg ccgagagctg 360
 ttgctgctgc tcatgcagta cctgtgccga gagtaccgcg atgggaaccc acgtgtgcgc 420
 agctggtgca ggacacacgc atccacctgg tgccctcact gaacctgat ggctacgagg 480
 tggcagcgca gatgggctca gagtttggga actgggcgct gggactgtgg actgaggagg 540
 gctttgacat ctttgaagat ttcccggatc tcaactctgt gctctgggga gctgaggaga 600
 ggaaatgggt cccctaccgg gtccccaaca ataacttgcc catccctgaa cgctaccttt 660
 cgccagatgc cacggtatcc acggaggtcc gggccatcat tgcttgatg gagaagaacc 720
 ccttcgtgct gggagcaa atctgaacggcg gcgagcggct agtatcctac ccctacgata 780
 tggcccgcac gccttaccga ggagcagctg ctggccgcac catggcagca rcccgggggg 840
 aggatgagga cgaggtytcc ragggccang agattccaga ccang 885

<210> 15
 <211> 1024
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (938)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1005)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1012)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1019)
 <223> n equals a,t,g, or c

<400> 15
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 gcgtgaactg cttcctgcag gctggccatg gcgcttcacg ttcccaaggc tccggggcttt 120
 gccagatgct caaggaggga gcgaaacact tttcaggatt agaagaggct gtgtatagaa 180
 acatacaagc ttgcaaggag cttgccc aaa ccactcgtac agcatatgga ccaaattggaa 240
 tgaacaaaat gggttatcaac cacttgagaga agttgtttgt gacaaacgat gcagcaacta 300
 ttttaagaga actagaagta cagcatcctg ctgcaaaaat gattgtaatg gcttctcata 360
 tgcaagagca agaagttgga gatggcaca actttgttct ggtatttgct ggagctctcc 420
 tggaaattagc tgaagaactt ctgaggattg gcctgtcagt ttcagaggct atagaagggt 480
 atgaaatagc ctgcagaaaa gctcatgaga ttcttcctaa tttgggatgt tgttctgcaa 540
 aaaaccttcg agatattgat gaagtctcat ctctacttcg tacctccata atgagtaaac 600
 aatatggtaa tgaagtattt ctggccaagc ttattgctca ggcatgcgta tctatttttc 660
 ctgattccgg ccatttcaat gttgataaca tcagagtttg taaaattctg ggctctggta 720
 tcagttcctc ttcagatttg catggcatgg tttttaagaa ggaaaccgaa gtgatgtaac 780
 atctgtcaaa gatgcaaaaa tagcagtgtg ctcttgcct tttgatggca tgataacaga 840
 aactaaggga acagtgttga taaagactgc tgaagrattg atgaatttta gtaagggagr 900
 agaaacctca tgggtgcaca agtcaaagct attgctgnta ctggtgcaat gtcgagtaca 960
 ggtggcaagt ggcagacatg gtctcatatg caataaatta attcntgtag gnggtaacnc 1020
 aaat 1024

<210> 16
 <211> 545
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (40)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (45)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (403)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (476)
 <223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (507)

<223> n equals a,t,g, or c

<400> 16

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cgacccacgc gtccggagag gagccccagc cttgggattc ccaagtgttt tcattcagtg 120
atcaggactg aacacagagg actcaccatg gagtttgggc tgagctggat ttcccttgct 180
gctattttaa aaggtgtcca gtgtgaggtg cagctgggtg agtctggggg aggcttggtg 240
aagcctgggg ggtcccttag actctcctgt gcagcctctg gattcacttt cagtaacgcc 300
tggtatgagct ggggtccgcc gggtccaggg aaggggctgg agtgggttgg ccgtattaaa 360
agcaaaactg atggtgggac aacagactac gctgcacccg tgnaaaggca gattcaccat 420
ctcaagagat gattcaaaaa acacgytgta tytgcaaatg aacagcctga aaaccngagg 480
acacagccgt gtattactgt accacangac ccctaattac tatgatagta rtgcaaaaag 540
ctttt 545
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<210> 17

<211> 623

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (15)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (613)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (616)

<223> n equals a,t,g, or c

<400> 17

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cggattcgcg gccgntcgac gccgagctgg gtgcggtgag gcgcgcagat caccgcgggt 60
cctgggcagg gcacggaagg ctaagcaagg ctgacctgct gcagctcccc cctcgtgcgc 120
tcgccccacc cggccgccgc ccgagcgctc gagaaagtcc tctcgggaga agcagcgctt 180
gttccccggg cagatccagg ttcaggtcct ggctataagt caccatggca cagcaagctg 240
ccgataagta tctctatgtg gataaaaaact tcatcaacaa tccgctggcc caggccgact 300
gggctgccaa gaagctggta tgggtgcctt ccgacaagag tggctttgag ccagccagcc 360
tcaaggagga rgtgggcgaa gaggccatcg tggagctggt ggagaatggg aagaaggtga 420
aggtgaacaa ggatgacatc cagaagatga acccgcccaa gttctccaag gtggaggaca 480
tggcagagct cacgtgcctc aacgaagcct cggtgttgca caacctcaag gagcgttact 540
actcagggtc catctacgta agtggctgcc gtggcacccc gcaggctggg tctgagggtc 600
ccgaggtggg ggnngngggc ggt 623
```

<210> 18

<211> 559

<212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (371)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (531)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (544)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (547)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (556)
 <223> n equals a,t,g, or c

<400> 18
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 attagtaatt ttaaaatgag grtggaatt aactaacaga actgatagga agtggttaaca 180
 tacaacaggg gagtctaaga tggcttccaa ttttcaacta gaggggtaag ggtaccatta 240
 acttaagatc attaatacag raaaattaat cagatttgga gtttaccaag gtttgctttt 300
 gggttgtaaca atgatatatg ataaaattaa atgrataaat aagtgratgc actggtgaat 360
 taatgagctg ntctcattaa gaccagagta cttatttata acaaaagtaa cttttccctt 420
 tccctgggta catcaaactg tactccacag ataacagaca ccagtgagtt tttcatgggt 480
 aaaaaagccc caactttgac ctataaatgt ggaccaagaa attaaaataa nctggaacca 540
 gcgngcnacg gtattngga 559

<210> 19
 <211> 1355
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (55)
 <223> n equals a,t,g, or c

<220>

<221> misc feature
<222> (1045)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1355)
<223> n equals a,t,g, or c

<400> 19
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cagtccacaa tgtcacctcg gcctcagggt ctgcatcagg ctacagcttct actctgggtgc 120
acaacggcac ctctgccagg gctaccacaa cccagccag caagagcact ccattctcaa 180
ttcccagcca ccaactctgat actcctacca ccttgccag ccatagcacc aagactgatg 240
ccagtagcac tcaccatagc acggtacctc ctctcacctc ctccaatcac agcacttctc 300
cccagttgtc tactgggggtc tctttctttt tctgtctttt tcacatttca aacctccagt 360
ttaattcctc tctggaagat cccagcacccg actactacca agagctgcag agagacattt 420
ctgaaatggt tttgcagatt tataaacaag ggggttttct gggcctctcc aatattaagt 480
tcaggccagg atctgtggtg gtacaattga ctctggcctt ccgagaaggt accatcaatg 540
tccacgacgt ggagacacag ttcaatcagt ataaaacgga agcagcctct cgatataacc 600
tgacgatctc agacgtcagc gtgagtgatg tgccatttcc tttctctgcc cagtctgggg 660
ctgggggtgcc aggtcggggc atcgcgctgc tgggtgctgg ctgtgttctg gttgcgctgg 720
ccattgtcta tctcattgcc ttggctgtct gtcagtgcg ccgaaagaac tacgggcagc 780
tggaacatct tccagccccg gatacctacc atcctatgag cgagtacccc acctaccaca 840
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caggtaatgg tggcagcagc ctctcttaca caaaccagc agtggcagcc acttctgcca 960
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gaagctcatg tgggccctga ggctcatgcc tgggaagtgt tgtggtgggg gctcccagga 1200
ggactggccc agagagccct gagatagcgg ggatcctgaa ctggactgaa taaaacgtgg 1260
tctccactg aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1320
aaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaan 1355

<210> 20
<211> 1280
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1043)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1162)
<223> n equals a,t,g, or c

<400> 20
aattcggcac gagccttacc caggtcctgc tcggggctgg ggagaacacc aaaacaaacc 60

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tggagagcat cctctctttac cccaaggact tcacctgtgt ccaccaggcc ctgaagggct 120
tcacgaccaa aggtgtcacc tcagtctctc agatcttcca cagcccagac ctggccataa 180
gggacacctt tgtgaatgcc tctcggaccc tgtacagcag cagccccaga gtcctaagca 240
acaacagtga cgccaacttg gagctcatca acacctgggt ggccaagaac accaacaaca 300
agatcagccg gctgctagac agtctgccct ccgatacccg ccttgctctc ctcaatgcta 360
tctacctgag tgccaagtgg aagacaacat ttgatcccaa gaaaaccaga atggaaccct 420
ttcacttcaa aaactcagtt ataaaagtgc ccatgatgaa tagcaagaag taccctgtgg 480
cccatttcat tgaccaaact ttgaaagcca aggtggggca gctgcagctc tcccacaatc 540
tgagtttggg gatcctggta cccagaacc tgaaacatcg tcttgaagac atggaacagg 600
ctctcagccc ttctgttttc aaggccatca tggagaaact ggagatgtcc aagttccagc 660
ccactctcct aacactaccc cgcataaag tgacgaccag ccaggatatg ctctcaatca 720
tggagaaaatt ggaattcttc gatttttctt atgaccttaa cctgtgtggg ctgacagagg 780
accagatct tcaggtttct gcgatgcagc accagacagt gctggaactg acagagactg 840
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ggcgagtata tgaccccagg gcctgagacc tgcaggatca ggtagggcg agcgctacct 1020
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cctcctgcct caggtgtccg ctatccacca aaagggctcc ctgagggctt gggcaagggg 1140
cctgcttcta ttagcccttc tnccatgccc tgccatgctc tccaaaccac tttttgcagc 1200
tttctctagt tcaagttcac cagactctat aaataaaacc tgacagacca tgaaaaaaaa 1260
aaaaaaaaac tcaagactag                                     1280

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<210> 21

<211> 1191

<212> DNA

<213> Homo sapiens

<400> 21

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gctttaactt gctctccttc ctccgggagc acaccttttt aagaaagcct gtcccttacc 120
ttgaagcaca aacatattct catttttatt ctcccaatac cttgaagggt ttcttctgca 180
catgtatttg tttgatctgc cttttgtgcg tgggggtggg gttaggtagg aatcttaag 240
tggagagcca gtttcttccc aaattactga cctaaccat ccttaacccc cagttcaagg 300
ccacctttgt gatagtgaag cttccacatg ctactcagc cccttctgct ctctcttctt 360
ctctactgtg catgtcggct tgtacttttg ccagtttctc taaagacaca accagagtgg 420
ggtggctgtg tgtgcacaac ttcaacttta catgtggggc tgagtcccta tgttgtatat 480
ccttgtgcaa aagcacaata tgtaattgc tatagctttt aaaaaataa ttaatagttt 540
ttcataatca aattttcttg cttttttgtt ttttcaaaaa agcatacttt tattgaagaa 600
taaacccttt atatatgtac acttatttat aactatgaac gcctgaacta ggatagaaat 660
gcatttgta tattacaaaa cataacaaaa ataatagggg tagggaggtg cagatgttgg 720
tcaaaggata taaacctgca gttctatgat gaataagttc tggacatctg gaatacagca 780
tggtgactat acttagtaat actatattgt acacttgaag cttactgaaa gagtaaatct 840
caagtgttct caccacacaa acccaaagg aactatgttc tcaccacaca aacccaaagg 900
gaactatgta ttaattagct tgattgtggg aaccatttca caatgtatac atttgccaa 960
acattatgtt gtatacctgg aatatataat tttatttatc aattatacct caataaagct 1020
gaaagagggg attactaatt cccacaaaa acagatttaa caaaaacttt tattcaacaa 1080
acagtgtctat gaagtgttaa attggaacaa aaagaaataa aatttcatcc acagtcttct 1140
catcaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaactcgtag g 1191

```

<210> 22

<211> 853

<212> DNA

<213> Homo sapiens

<400> 22

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acgccattcg gctcaggatg tggcactggc ttgcaatcaa gtggcttagg ttcttcaaac 120
cttggaggat ttggaactag ctctgggttt ggatgcagca ccacaggggc ctccacattt 180
ggatttgga caacaaataa accctcagga agtcttagtg caggctttgg cagctcaagt 240
acatctgggt ttaacttcag caatcctggc atcacggcat cagctgggtt gacttttggg 300
gtgtccaatc ctgcctctgc aggttttgga acaggaggac aactccttca gttgaagaaa 360
cctccagctg graacaaaag aggaaaaaga taaacatggg ttgatgtgtt gagagaatcc 420
atagcagcac cggttcattct atgagtctat ttttctaata atgcagtaat taaattgcat 480
cccaggagat ttataaagtt ttgatatttt tccctactct ggratttgaa ctttcttcat 540
gtttgccata ctgaacawct tttttcttgt ggaattttaa gtccagctgt gttttctttt 600
taatttgatt ctcagtgtaa gaaatgttct gattacatca ctgattggta atgggttagaa 660
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tgaatacatg cacatttggt tcttatacag gtggtgtgaa ctctagggcc tatactagaa 780
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```

<210> 23

<211> 474

<212> DNA

<213> Homo sapiens

<400> 23

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caggtaatat ttgacttttg cttcatatta atctgagtgg aaaataaaaag ggccctcttc 120
tcctctcgct tccctgccgg gcaggcgcca tggcggaagc tcggcgacgg gcgcctgcgg 180
agaggcgatg gcagcggcgg aaggctcctc gggcccggcg ggcttgactc tgggcccggag 240
cttctcgaac taccggccct tcgagcccca ggcgttgggc ctgagcccga gctggcggct 300
gacgggcttc tccggcatga agggctgagg ctgcaaggtc ccgcagaggc gctgctcaaa 360
ctcctggcgg gactgamgcg gccggacktk cggccccgct gggccggggc ctkgtkggk 420
gccargaara agcgtcccag gaagccggcc tgccggcaag agcgggcccc agcc 474

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<210> 24

<211> 2280

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (13)

<223> n equals a,t,g, or c

<400> 24

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agtagccgcc gccggagccg cgcgcарcca tggccgagaa cccagcttg gagaaccacc 120
gcatcaagag cttcaagaac aagggccggc atgtggaaac aatgcgaaga catagaaatg 180
aagtgcaggt ggaactgcgg aagaacaaaa gagatgaaca cttattgaaa aagagaaatg 240
ttccccaaga agaaagtcta gaagattcag atgttgatgc tgattttaaa gcacaaaatg 300

```

```

taaccctaga agctatattg cagaatgcca caagtgataa cccagtgggc caattgagtg 360
ctgtccaggc agcaagaaaa ctgttatcca gtgacagaaa tccaccgatt gatgacttaa 420
taaaatctgg gattttacca attctagtca aatgtctaga aagggatgat aatccttcat 480
tacagtttga agctgcttgg gcattaacta acatagcatc aggracttct gcacagactc 540
aagctgttgt gcagtctaata gcagtacctc tttttctgag acttcttcgt tcaccacatc 600
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ccatccccat cacttccctt cggaacgtca catgggtcat tgtcaatctc tgcaggaata 780
aggatcccc accgcctatg gagacagttc aggagatttt gccagcttta tgtgtcctca 840
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atggaggtaa tgaacagata cagatggtta ttgattcagg agttgtgccc tttcttgtgc 960
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tcccaaatct cttatcacac ccaaaagaga agataaataa ggaagcagtg tggttccttt 1140
ccaacataac agcaggcaac cagcaacaag ttcaagctgt aatagatgct ggattaattc 1200
ctatgataat tcatcagctt gctaaggggg actttggaac acaaaaagaa gctgtctggg 1260
caatcagcaa cttaacaata agtggcagaa aagatcagggt tgagtacctt gtacagcaga 1320
atgtaatacc accgttctgt aatttactgt cagtgaagaa ttctcaagtg gttcaggtgg 1380
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aagacatata taaattagca tttgaaatca tagatcagta tttctctggt gatgatattg 1560
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cagccaacct tcaaacaaaa gaatttaatt tttaaattca gttgagtga gcactcttcc 1680
cacattcaat atgaagcacc accagatggc taccaaatga taagaacaac agcaacmaaa 1740
ggctccaaaa cacacatgcc tctttgtttt gatgcttcta aagcaagcca tgtctcagtc 1800
actttgcagt tgccaaaagt cactatcaca tggactgtaa atgcatatgc atgatttcc 1860
aaactgtttt agaactctcc ttaacaatct caactaccct atttttccct gttccctgg 1920
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cagctgcccc ctgatactcc tttggaaaat ggtgcgctgt ggatcaagac actttgggtat 2040
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cctccacaaa catattttca tattctttat gtggaagaat agattttaaa gtacaagcca 2160
aatgattttc attggtggaa ctgacacaaa aaaagtaact taaaaacaag aaacttggt 2220
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```

<210> 25

<211> 1061

<212> DNA

<213> Homo sapiens

<400> 25

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atggcaggct ctgaagagct ggggtctccg gaagacacgc tgagggtcct agctgccttc 180
cttaggcgtg gtgaggctgc cgggtctcct gttccaactc cacctagaag ccctgcccc 240
gaagagccaa cagacttctt gagccgcctt cgaagatgtc ttccctgctc cctggggcga 300
ggagcagccc cctctgagtc ccctcgccct tgcctctgtc ccatccgccc ctgctatgg 360
ttagagcctg gccagctac tccagacttc tatgctttgg tggccagcgc gctggaacag 420
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gagaaggaa ccatactgcg gaggtgggtg gccctgctgg aggaggaggc agaagtcatt 540
aaccagaagc tggcctcgga ccccgccctg cgcacaagct ggtccgctg tccctcgact 600
ctttcgcccc cctgggtggag ctgttctgta gccgggatga cagctctcgc ccaagccag 660

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catgccccgg gcccccgcct ccttccccgg agccccctggc ccgcctggcc ctagccatgg 720
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tgcacagctt cacgccctgg atccaggcca cgggggctgg gagggcatcc tggctgtttc 840
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cacctcatgt ccctgccctc ttcgtgtgct tttccaagtc ttcctattcc actcagggct 960
gtgggggtggg gggtgcccta cctgtttttg ccaaaaataa attgtttaa acttttctta 1020
ttaaaaacgt tacaataaaa aaaaaaaam aggggggccc c 1061

<210> 26

<211> 1572

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (19)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (28)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1491)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1527)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1555)

<223> n equals a,t,g, or c

<400> 26

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gggcagctgc ggacatgtcg accccggccc ggaggaggct catgcgggat ttcaagcggg 180
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taatagaatt ttctgaagaa tatccaaata aaccaccaac tgtaggttt ttatccaaaa 360
tgtttcatcc aaatgtgtat gctgatggta gcatatgttt agatatcctt cagaatcgat 420
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cgaatcctaa cagtcagcc aatagccagg cagcacagct ttatcaggaa aacaaacgag 540
aatatgagaa aagagtttcg gccattgttg aacaaagctg gaatgattca taatagacaa 600
ctggtctgtt aatctttttc atcattgttg tgtataattt acctctcatt agaaaggcta 660
acaaatttta agtgccacag gttttaagga ttctgcagaa aaaaaagaaa aaagtccttc 720

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agtttagaac ctacaaaagc ttgtgtatct tgattaatgt acttttttatt gcatgggtgtg 780
aactaagtta ttgctgcata aatttgtaat atatacctgtt tgtattttttt tccaagtgtg 840
taatgttggt gtggagtttt catgacagaa tatacacatt ttgtaaatct gtactttttt 900
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<210> 27

<211> 2005

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1976)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1977)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1978)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1979)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1986)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1988)

<223> n equals a,t,g, or c

<400> 27

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gcggacgcgt gggtcgccma cgcgygcgca agcagcgggt tagtggtcgc gcgcccagacc 60
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cgcctccgcc gcctagcgct gttcccgggt gtggcgctgc ttcttgccgc ggcccgctc 180
gccgctgcct ccgacgtgct agaactcacg gacgacaact tcgagagtcg catctccgac 240
acgggctctg cgggcctcat gctcgtcgag ttcttcgcyc cctgggtgtgg aactgcaag 300
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aaggttgatt gcactgccaa cactaacacc tgtaataaat atggagtcag tggatatcca 420
accctgaaga tatttagaga tgggtaagaa gcagggtgctt atgatggacc taggactgct 480
gatggaattg tcagccactt gaagaagcag gcaggaccag cttcagtgcc tctcaggact 540
gaggaagaat ttaagaaatt cattagtgat aaagatgcct ctatagtagg ttttttcgat 600
gattcattca gtgaggctca ctccgagttc ctaaaagcag ccagcaactt gagggataac 660
taccgatttg cacatacga tgttgagtct ctggtgaacg agtatgatga taatggagag 720
ggtatcatct tatttcgtcc ttcacatctc actaacaagt ttgaggacaa gactgtggca 780
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gttgggggaa atgttggtgg ggtggggttg agttgggggt attttctaata ttttttgtta 1920
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2005

<210> 28

<211> 1408

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (11)

<223> n equals a,t,g, or c

<400> 28

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ttcactgcaa ggggggcaac gtgtgggttg ctctattcaa gaacaacgag cccgtgatgt 120
acacgtacga cgagtacaaa aagggtcttc tggaccaggc atctgggagt gcagtgtgct 180
tgctcaggcc cggagaccgg tttcctcca gatgccctca gaacaggctg caggactgta 240

```

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tgccgggcag tatgtccact cctccttttc aggatattta ttgtatccca tgtaaaaaaca 300
aaaaaacaaa aaacaaagaa aagaaagaga ttttatagaa gaaaatgaca caccacaaaaa 360
tccaaatgaa aaacataatt gcttcaaaac acttacacag ttggaaagtt atatgtaagt 420
gaaaatttgg accattgtgt acaataaaaa actaagatgc atgtttaata ctccacacag 480
cagcctgtaa ttgcgaatga tgggatagag ttatgtatca agtactgaca cttggttgta 540
cccactggaa tcatatttagc tgttttatgt tatatgcttc cacagtaacc tgcttattca 600
gatcagtcaa aatatatcag tatgaaagat catagctaata gaaaggcact cactcatatt 660
gtttacttta aaatatattat aaatatgcct taaagaaata caaatgataa caattacata 720
ccgtattttac ttgcttaatt tcctctgtat ttgtgtagat actttgacat ggaatatatg 780
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tatcagttat gcttatatag cattaataat tctcctcctt tgactacaca cacaaccaca 1320
gtgtggttct aatcatggag atatcagtaa tttttagtaa ctgarttttg aggacatttc 1380
tctgttttagc atgtatgcaa actggata 1408

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<210> 29

<211> 917

<212> DNA

<213> Homo sapiens

<400> 29

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ggcacgagcg aggggaggag ccgctggctc ccagccccgc cgcgatgagc ctcggccgcc 60
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ggaccatgtg cgcgtcccg gacgactggc gctgtgcgct ccattgcacga kttttccgcc 180
aaggacatcg acgggcacat ggtaaacctg gacaagtacc ggggcttcgt gtgcatcgtc 240
accaacgtgg cctcccagtg aggcaagacc gaagtaaact acactcagct cgtcgacctg 300
cacgcccgat acgctgagtg tggtttgcgg atcctggcct tcccgtgtaa ccagttcggg 360
aagcaggagc caggagagta cgaagagatc aaagagttcg ccgcgggcta caacgtcaaa 420
ttcgaatatg tcagcaagat ctgcgtgaac ggggacgacg cccacccgct gtggaagtgg 480
atgaagatcc aaccaaggg caagggcac ctaggaaatg ccatcaagtg gaacttcacc 540
aagttcctca tcgacaagaa cggctgcgtg gtgaagcgct acggacccat ggaggagccc 600
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gagccccctg ccacgcccty ggagccttcc accggcactc atgacggcct gcctgcaaac 720
ctgctggtgg ggcagacccg aaaatccagc gtgcaccccg ccggaggaag gtcccattgg 780
ctgctgggct tggctcggcg cccccacccc tggctacctt gtgggaataa acagacaaat 840
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aaaaaaaaa aaaaaaa 917

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<210> 30

<211> 577

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (501)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (534)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (568)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (575)
 <223> n equals a,t,g, or c

<400> 30
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 ggtgactcac atctgtaatc ccagcacttt gggaggccaa ggcaggcaga acacttgaag 120
 gagttcaaga ccagcgtggc caacgtgggtg aaccctgtct ctactaaaaa tacaaaaatt 180
 gtttagctct gtttttcata atagaaatag aaaaggtaaa attgcttttc ttctgaaaag 240
 aacaagtatt gttcatccaa gaagggtttt tgtgactgaa tcagcagtgc ctgccctagt 300
 catagctgtg cttcagaaac ctcagcatga ttagtgttkg agcmmaacaa ggragcaaag 360
 caaatwcvgt ttttgaaatt ctatctgttg cttgaactat tttgtaataa ttaaaccttg 420
 gatgttgaga aatcacaaact ttattggtac acttcattgc aacttgaaat tccatgggtc 480
 ttaaagttag attggaattc naatgggagg cctttaaaaa gtaattccca accnttaagg 540
 ttaaaaccca ggaaattggg gccaatcnaa aaccngg 577

<210> 31
 <211> 2059
 <212> DNA
 <213> Homo sapiens

<400> 31
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 actccttttt gcagtggaca caggactata tttctctgtg aagacaaaca ttcgaagctc 180
 aacaagagac tggaaggacc ataaatttaa atggagaaag gaccctcaag acaaatgacc 240
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 tgcaacccca tcatcctcag gcctctctac aagcagcagg aaacatagaa ctcagagcca 360
 gatcccttat ccaactctcg acttttccctt ggtctccagt ggaagggaaa agcccatgat 420
 cttcaagcag ggaagcccca gtgagtagct gcattccctag aaattgaagt ttcagrgcta 480
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 cacctgcctt cccgacaagg tgtgtgtcca ccgaagcacc atctaccctg tgggccagtt 780
 ctgggaggag ggctgcgatg tgtgcacctg caccgacatg gaggatgccg tgatgggcct 840
 ccgcgtggcc cagtgtctcc agaagccctg tgaggacagc tgtcggtcgg gcttcactta 900

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ctgctgcctg ccttgccctga tggccaggcc agagtgtctc cagtcctctg catgttctgc 1980
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aaaaaaaaa aaaaaaaaaa

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<210> 32

<211> 549

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (337)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (378)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (497)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (537)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (546)

<223> n equals a,t,g, or c

<400> 32

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tctagaggat ccaagcttac gtacgcgtgc atgcgcgtc atagctcttc tatagtgtca 180
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```

549

<210> 33

<211> 841

<212> DNA

<213> Homo sapiens

<400> 33

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ttgtttggtt gagaggaaca tccccatctc aaggccgaac ctgtgtgaac ctcatgccaa 360
gcacagatat arggctggcg caggtgcttc cyaaagctya ccttcctgga gatgacatgc 420
atagaaagag ggggtgggac tttttacttc actaggagaa cttgtaacac catggggaag 480
tcagctgaaa cttgtcttgt tttgccagga aaggaagtag ttgcctttgg tcatccatct 540
gctaatagtc acagaatata gtgaaatgac atagttttgg gttagatttt ataatgcaa 600
gattcagatc caaaataatt tcatacccca ttttttcaca gaattcttat atagtaaagt 660
tatcaagttt aataaagcat ctcatgttca aataatatct tggattttat ttataattag 720
agggatttat gagtgattgc tctacattat ttcttcaaag gaaaggaaag gaattgaaga 780
ctttgctact ctctggtgtaag acttgaatgt gattatttta taaataaaaag aaccactatg 840
a

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841

<210> 34

<211> 863

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (19)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (29)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (44)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (58)

<223> n equals a,t,g, or c

<400> 34

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tggaatcccc ccggggcctt caaggaattc ggcacgagtt tgcttaggcg cagacgggga 120
agcggagcca acatgccagt ggcccggagc tgggtttgtc gcaaaactta tgtgaccccg 180
cggagaccct tcgagaaatc tcgtctcgac caagagctga agctgacgag cgagtatggg 240
ctccggaaca aacgtgaggt ctggagggtc aaatttaccg tggccaagat ccgcaaggcc 300
gcccgggaac tgctgacgct tgatgagaag gaccacggc gtctgttcga aggcaacgcc 360
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atcctggggc tgaagataga ggatttctta gagagacgcc tgcagaccca ggtcttcaag 480
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gtccgcaagc aggtggtgaa catcccgctc ttcattgtcc gcctggattc ccagaagcac 600
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aatgccaaga agggccaggg tggggctggg gctggagacg acgaggagga ggattaagtc 720
cacctgtccc tcctgggctg ctggattgtc tcgttttcct gccaaataaa caggatcagc 780
gctttacaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 840
aaaaaaaaaa aaaaaaaaaa ttt                                     863

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<210> 35

<211> 1230

<212> DNA

<213> Homo sapiens

<400> 35

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cctgcagcgc ttggtagagc agctcaagtt ggaggctggc gtggagagga tcaaggtctc 120
tcaggcagct gcagagcttc aacagtactg tatgcagaat gcctgcaagg atgccctgct 180
ggtgggtggt ccagctggaa gtaacccctt ccgggagcct agatcctgtg ctttactctg 240
aagactctag gagagaagtt tgctgaggaa tgccttcaag cacaaagtga tgaatgactg 300
ccttcaagtc tcaagaaaac acttttccct aactttttaga gatatttcag ccctttcctg 360
tggcctggtc ctatagccaa aatcacagat attcatgagt ttctacttga gtgagaaaac 420
tgggtgaagg aatagaattt taaatagtaa taactgcttg ttttttttgt gcaagtactt 480
ttatacataa gataaacaac aaccttacca ccaaacatac caaatgcac ctctttcata 540
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1230

<210> 36

<211> 640

<212> DNA

<213> Homo sapiens

<400> 36

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gtgctggcaa aaagccgaag gagtaaagggt gctgcaatga tgtagctgt ggccactgtg 540
gatttttcgc aagaacatta ataaactaaa aacttcaaaa aaaaaaaaaa aaaaaaaaaa 600
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<210> 37

<211> 597

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (10)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (15)

<223> n equals a,t,g, or c

<220>

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<222> (32)

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<222> (556)

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<221> misc feature

<222> (558)

<223> n equals a,t,g, or c

<220>

<221> misc feature
 <222> (567)
 <223> n equals a,t,g, or c

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 <221> misc feature
 <222> (590)
 <223> n equals a,t,g, or c

<400> 37
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 gtccggcagc gccagcccta cactcggccg cgccatggcc tctgtctccg agctcgcctg 180
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<210> 38
 <211> 624
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (79)
 <223> n equals a,t,g, or c

<400> 38
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 gggttttttc tttgtattgc tggt 624

<210> 39
 <211> 1029
 <212> DNA
 <213> Homo sapiens

<400> 39
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<210> 40

<211> 1107

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1098)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1106)

<223> n equals a,t,g, or c

<400> 40

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gaaaactgcg agccagcatt acccccggga ccattctgat catcctcact ggacgccaca 180
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acaaattgggt gttctaatag tcttaagaac ctaattaaat agctgactac aaaaaaaaaa 1020

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gggcccgggt cccatttngc cctttng 1107

<210> 41

<211> 1051

<212> DNA

<213> Homo sapiens

<400> 41

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ttttttttgc ataaarwaaa aaaaaaaaac c 1051

<210> 42

<211> 2192

<212> DNA

<213> Homo sapiens

<400> 42

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<210> 43
 <211> 353
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (37)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (348)
 <223> n equals a,t,g, or c

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<400> 43
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tggccctctg gacaagtggc gggccctgca ctcatgaggg cttccaatgt gctgcccccc 240
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<210> 44
 <211> 3490
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature

<222> (782)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1311)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2298)

<223> n equals a,t,g, or c

<400> 44

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<210> 45

<211> 781

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (750)

<223> n equals a,t,g, or c

<400> 45

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aggagtgggc gttgctggac cctgccccaa ggacactgta cagggatgtg atgctggaga 660
actgcaggac ctggcctcac targgtgtcg tgtaataaaa cccagtctga tatccagtt 720
ggamcaagac aagaagktgg tgacagaggn aagaggaatc taccaagcac ctgtccagat 780
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<210> 46

<211> 1431

<212> DNA

<213> Homo sapiens

<400> 46

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<210> 47

<211> 1913

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (43)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1878)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1896)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1905)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1907)

<223> n equals a,t,g, or c

<400> 47

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cccacgcgctc cggccagctc attgctctta tagcctgtga ggnagraaga aacatttgcy 60
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cttcatgcct gtcctgggat ttggcaccta tgcgcctgca gaggttccta aaagtaaagc 180
tytagaggcc rycaaattgg caatwgaagc yggsttccrc catattgatt ctgcwcatkt 240
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gaagagagaa gacatattct acacttcaaa gctttggwgc aattcccatc gaccagagtt 360
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cctggaatct ttggatgtgt gccagttca cagattggac cctattgggt ttgtggtggg 1860
ccagggcatc caaagacntc attggactaa ttcacnttc cccgnanagc ccc 1913

```

<210> 48

<211> 1761

<212> DNA

<213> Homo sapiens

<400> 48

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cgaggagctc tgaggctctat gctcagctgt gcaacgtggc tcgcattgag gcagagcggg 60
aggccggggg ccacttccgg ccaggctatg agtatggccc cggggccgat gacctgcact 120
acagcatcta tggcccagat gggggccccc tctacaacta cctggggccc gaggacaccg 180

```

```

tccctgagcc tgccttcccc aacacagccg gtcactcagc ggaccgcaca cccatccttg 240
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cagccggctt cgaagggtt caggcggagg agtgcggcat cctgaacggc tgtgagaatg 360
gccgctgtgt gcgcgtgcgg gagggctaca cctgtgactg ttttgagggc ttccagctgg 420
atgcggccca catggcctgc gtagatgtga atgagtgtga tgacttgaac gggcctgctg 480
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cgggatatgt ggctgaggca gggccccccc actgcactgc caaggagtag cagtcagggg 600
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aaaaaaaaaa aaaaaaaaaa g                                     1761

```

<210> 49

<211> 956

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (37)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (352)

<223> n equals a,t,g, or c

<400> 49

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cgccgcccgc ccgcaaacct tcgtgcccgg cccgtcctcg ccccgccctc cgccaccgcc 120
tcggcccgcga gagcttgccc cctccccacc cgcagacatg tccgagtcca agagcggccc 180
cgagtatgct tcgtttttcg ccgtcatggg cgcctcggcc gccatggtct tcagcgcctt 240
gggcgtgcc tatggcacag ccaagagcgg taccggcatt gcggccatgt ctgtcatgcg 300
gccggagcag atcatgaagt ccatcatccc agtgggtcatg gctggcatca tngycatcta 360
cggcctgggtg gtggcagtc tcatcgccaa ctccctgaat gacgacatca gcctctacaa 420

```

```

gagcttcctc cagctgggcg ccggcctgag cgtgggcctg agcggcctgg cagccggctt 480
tgccatcggc atcgtggggg acgctggcgt gcggggcaac gccagcagc cccgactatt 540
cgtgggcatg atcctgattc tcattcttcg cgagggtgctc ggcctctacg gtctcatcgt 600
cgccctcatc ctctccacaa agtagaccct ctccgagccc accagccaca gaattattatg 660
traagaccac ccctcctcat cgccccctcca ggcccccggc gcccacccc ctagagtgt 720
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tagagtgtcg ccttgtgggt tcctgttgct gagacttcct ggatggagcc gccctcaccg 900
wmcgkcccgt ggccctgcgc ggagctgtgt ccaataaagt tcttggtgt gaaaaa 956

```

<210> 50

<211> 563

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (510)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (519)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (530)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (558)

<223> n equals a,t,g, or c

<400> 50

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cggacgcgtg ggcgcctcc gaatccagag aggcgctgct gacaccgccg ccacaccgcc 60
gccacaccgc cgtgcctca gtcatgccga agcacgagtt ctctgtggac atgacctgtg 120
gaggctgtgc tgaagctgtc tctcgggtcc tcaataagct tggaggagtt aagtatgaca 180
ttgacctgcc caacaagaag gtctgcattg aatctgagca cagcatggac actctgcttg 240
caaccctgaa gaaaacagga aagactgttt cctaccttg ccttgagtag caggggcctg 300
gtccccacag cccacaggat ggaccaaagg gggcaggatg ctgacctcc cgctggcttc 360
cagacagacc tgggacttgg cagtcatgcc gggatgatgg gttcctgcgg agaccctcag 420
ttgtcctatt ccttcctagc ttccctgcaa taaaatcaag ctgcttttgt tggaaaaaaa 480
aaaaaaaaaa gggggcgtct aaaaaccaan ttatttcnt gatgaaatcn acctctttgt 540
tcccatcat ccggcctnaa aaa 563

```

<210> 51

<211> 3215

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (3196)

<223> n equals a,t,g, or c

<400> 51

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gcctcgggtg ggggtgggagc ggggggggaca gtgccccggg aacccggtgg gtcacacaca 60
cgcactgcgc ctgtcagtag tggacattgt aatccagtcg gcttgttctt gcagcattcc 120
cgctcccttc cctccatagc cacgctccaa accccagggg agccatggcc gggtaaagca 180
agggccattt agattaggaa ggtttttaag atccgcaatg tggagcagca gccactgcac 240
aggaggaggt gacaaaccat ttccaacagc aacacagcca ctaaaacaca aaaaggggga 300
ttgggcggaa agtgagagcc agcagcaaaa actacatttt gcaacttgtt ggtgtggatc 360
tattggctga tctatgcctt tcaactagaa aatttctaag attggcaagt cacgttgttt 420
tcagggtccag agtagtttct ttctgtctgc tttaaatggr aacagactca taccacactt 480
acaattaagg tcaagcccag aaagtataaa gtgcagggag gaaaagtgcg agtccattat 540
gtaatagtga cagcaaaggg accaggggag aggcattgcc ttctctgccc acagtctttc 600
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tgtgtcagaa aaaggaaacc acagtgcgac tgagagagac ggcgattttc gggctgagaa 780
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tgtaacactt ggctcttggg acctgtgggt tagcatcaag ttctccccag ggtagaattc 2700
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aaaatctgtt tttctcatca gactctgagt aactggttgc tgtgtcataa cttcatagat 2820
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cagatgtttt gatgttatcg cttatgttaa tagtaattcc cgtacgtgtt cattttattt 3120
tcatgctttt tcagccatgt atcaatattc acttgactaa aatcactcaa ttaatcaawa 3180
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<210> 52

<211> 626

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (571)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (572)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (573)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (618)

<223> n equals a,t,g, or c

<400> 52

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cagtttgtgt attgcggcaa gaaggccag ctcaacattg gcaatgtgct ccctgtgggc 60
accatgcctg aggttacaat cgtgtgctgc ctggaggaga agcctggaga ccgtggcaag 120
ctggcccggg catcaggga ctatgccacc gttatctccc acaaccctga gaccaagaag 180
accctgtgtg agctgccctc cggctccaag aaggttatct cctcagccaa cagagctgtg 240
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cgcagagatg cccctgctgg ccgcaaagtg ggtctcattg ctgcccgcgc gactggacgt 480
ctccggggaa ccaagactgt gcaggagaaa gagaactagt gctgagggcc tcaataaagt 540
ttgtgtttat gccaaaaaaa aaaaaaaaaa nnnngggggc cgctttarag rwtctccaa 600
ggggccaact tacccttnca tgcaaa 626

```

<210> 53

<211> 920

<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (617)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (621)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (725)
<223> n equals a,t,g, or c

<400> 53
atgagggctc ggctacagca agaagtagag gagcagctca aaaagaaatg tttcactctg 60
ctctgtctact atgatcccaa ttcagatgct gacagtgaag ccgtgaaggc agcaaagggtg 120
tggaactctg cagagtcctg gtgggtgagc agcagcagtg ccasgatgcc aagagccagc 180
agaaggagca gatgttgctg ctggagaaka agagtgtctg ttactcccag gtgcttctcc 240
gctgcctcac tttgctgcag aggttcttc aagaacaccg gctgaagact caatccgagc 300
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ggaanatstt acgcttgaaa cactgcagtc atttaggcac tctcctggtt tctctttatt 780
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attawaaaaa aaaaaaaaaa 920

<210> 54
<211> 1090
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1024)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1034)
<223> n equals a,t,g, or c

<400> 54

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tctctggagt gactttttct cctcgaattg aaacaagtct atggcaaaag aagctgcatt 120
tttttcacaa aagggaagat ggtaacaatg gtcacttcaa acttttgggc taaattatat 180
gtacacagaa atgttcaaaa tcatagtttt aatgtgtttt gaaaaggcca cacaattata 240
ctttatcttt tcttaataat cctgcaaadc tctgccctgg aatccgaaat ctgaaaatgt 300
actggcttga acaaaatttg ttttgtgtgt tagagttata aatcattaat ctttatttcg 360
gggtggtttac gtttatgcca gtccctttat atttaaattt cttgttttat atattttgaa 420
tgtctttata gatttcttta aatttcctta tagaaccatt aatagaaaat cattacattt 480
aaaatatacc ttacagcaaa agcatccaaa taagtatagg gtttatgtcc ttatttttct 540
ttcagctgaa tacgaatgaa cacagtgggt gaatttctga agggaagtga tgaaattata 600
tttatttcag tgggcacttt tccattttac cactgtacca ttatttggtt cctggaagtta 660
tacactaatt ttcagtatat tactgttaaa ttaccaacac aaggcaattt atttgaaaga 720
ttccgttttat cctgccattg ctttgaaaag cagcaggaaa cgaaatcctt tgacttggtat 780
cagcttctgc agagcatctt tgttttcctt tgtcctttgt ttcctacctt ttgaatcaga 840
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aattgcatga agtggattga tcatgagcaa atgatgtgct tatttctccc tcaactgttg 960
atatctttga acttgctgtt ttcaatatgg gcagcacaaa ggtgagagat acatattaat 1020
agtngtatgt attnctotta tacattagat acctatattt aaatgaaagg gccaatattg 1080
aaacatatac                                     1090
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<210> 55

<211> 1464

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (766)

<223> n equals a,t,g, or c

<400> 55

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ccgctccgga attcccgggt cgaccacgc gtccgccac gcgtcgcca cgcgtccggg 60
gacgtctca gctctcggcg caggccag cttccttcaa aatgtctact gttcacgaaa 120
tctgtgcaa gctcagcttg gaggtgatc actctacacc cccaagtga tatgggtctg 180
tcaaaacctt tactaacttt gatgctgagc gggatgcttt gaacattgaa acagccatca 240
agaccaaaag tgtggatgag gtcaccattg tcaacatttt gaccaaccgc agcaatgcac 300
agagacagga tattgccttc gcctaccaga gaaggaccaa aaaggaactt gcatcagcac 360
tgaagtcagc cttatctggc cacctggaga cggtgatttt gggcctattg aagacacctg 420
ctcagtatga cgcttctgag ctaaaagctt ccatgaaggg gctgggaacc gacgaggact 480
ctctcattga gatcatctgc tccagaacca accaggagct gcaggaaatt aacagagtct 540
acaaggaaat gtacaagact gatctggaga aggacattat ttcggacaca tctggtgact 600
tccgcaagct gatggttgcc ctggcaaagg gtagaagagc agaggatggc tctgtcattg 660
attatgaact gattgaccaa gatgctcggg atctctatga cgctggagtg aagaggaaag 720
gaactgatgt tcccaagtgg atcagcatca tgaccgagcg gagtgncccc acctccagaa 780
agtatttgat aggtacaaga gttacagccc ttatgacatg ttggaaagca tcaggaaaga 840
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cctgtatttt gctgatcggc tgtatgactc catgaagggc aaggggacgc gagataaggt 960
cctgatcaga atcatggtct cccgcagtga agtggacatg ttgaaaatta ggtctgaatt 1020
caagagaaag tacggcaagt ccctgtacta ttatatccag caagacacta agggcgacta 1080
ccagaaagcg ctgctgtacc tgtgtggtgg agatgactga agcccagacac ggcttgagcg 1140
```

```

tccagaaatg gtgctcacca tgcttccagc taacaggtct agaaaaccag cttgcgaata 1200
acagtccccg tggccatccc tgtgagggtg acgttagcat taccaccaac ctcatttttag 1260
ttgcctaagc attgcctggc cttcctgtct agtctctcct gtaagccaaa gaaatgaaca 1320
ttccaaggag ttggaagtga agtctatgat gtgaaacact ttgcctcctg tgtactgtgt 1380
cataaacaga tgaataaaact gaatttgtac tttaraaaaa aaaaaaaaaa aactyrgggg 1440
ggggcccgka cccattggcc ttag                                     1464

```

<210> 56

<211> 985

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (647)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (875)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (962)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (973)

<223> n equals a,t,g, or c

<400> 56

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agaagttgct agtgttcaat gcagctgggg tgaaacccca ggggcaaggt ggctggcttt 60
gatctggacg ggacgctcat caccacacgc tctgggaagg tctttccac tggccccagt 120
gactggagga tcttgtaccc agagattccc cgtaagctcc gagagctgga agccgagggc 180
tacaagctgg tgatcttcac caaccagatg agcatcgggc gcgggaagct gccagccgag 240
gagttcaagg ccaaggtgga ggctgtggtg gagaagctgg ggggtcccctt ccaggtgctg 300
gtggccacgc acgcaggctt gtaccggaag ccggtgacgg gcatgtggga ccatctgcag 360
gagcaggcca acgacggcac gcccataatc atcggggaca gcatctttgt gggagacgca 420
gccggacgcc cggccaactg ggccccgggg cggaagaaga aagacttctc ctgcgccgat 480
cgctgtttg ccctcaacct tggcctgccc ttcgccacgc ctgaggagtt ctttctcaag 540
tggccagcag ccggcttcga gctcccagcc tttgatccga ggactgtctc ccgctcaggg 600
cctctctgcc tccccagatc cagggccctc ctgagcgcca cccggangtg gttgtcgcag 660
tgggattccc tggggccggg aagtccacct ttctcaagaa gcacctcgtg tcggccggat 720
atgtccacgt gaacagggac acgctaggct cctggcagcg ctgtgtgacc acgtgtgara 780
cagccctgaa gcaagggaaa cgggtcgcca tcgacaacac aaaccagac gccgcgagcc 840
gcgccaggtg cgtccartgt gcccgagccg cggngtacc cctgccgctg cttcctcttc 900
accgccactc tggagcaggc gcgccacaac aaccgggtga gcccgcttca gcccgggaca 960
cnccccgggg atngcacccc ctgga                                     985

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<210> 57
 <211> 1246
 <212> DNA
 <213> Homo sapiens

<400> 57
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 aaggccgtgg tgcagcgcgt caccggggcc agcgtcacag ttggaggaga gcagattagt 120
 gccattggaa ggggcatatg tgtgttgctg ggtatttccc tggaggatac gcagaaggaa 180
 ctggaacaca tgggtccgaaa gattctaaac ctgcgtgtat ttgaggatga gagtgggaag 240
 cactggtcga agagtgtgat ggacaaacag tacgagattc tgtgtgtcag ccagtttacc 300
 ctccagtgtg tcctgaaggg aaacaagcct gatttccacc tagcaatgcc cacggagcag 360
 gcagaggggt tctacaacag ctctctggag cagctgcgta aaacatacag gccggagcct 420
 atcaaagatg gcaagtttgg ggcctacatg caggtgcaca ttcagaatga tgggcctgtg 480
 accatagagc tggaatcgcc agctcccggc actgctacct ctgacccaaa gcagctgtca 540
 aagctcgaaa aacagcagca gaggaagaa aagaccagag ctaagggacc ttctgaattc 600
 aagcaaggaa agaaacactc cccgaaaaga agaccgcagt gccagcagcg gggctgaggg 660
 cgacgtgtcc tctgaacggg agccgtagct caggaggcag aattcagtgt gttatcattg 720
 ggcagaactg gatcctgaaa aattcaagat gctaagcacc tacactactt taagaatttg 780
 gaactgaaac atgaagagga agacagaaat aagaatttgg gaacctgaat agctctgcaa 840
 aaaacaccaa aggaccgttt tatcgttttc tgtgtgtgct gtggtggagt gatgcagtgg 900
 gcactkccsg tgggcccagg ggcgggtgcg catgtggtag aagggtgtgcg ctcgtgcctc 960
 cccacagaa aggctttgtt ggtttctacc acatcttggc ttgcttttgg aacaggctgg 1020
 cccagcatc atttgtcatc aagtccactg tgggtgtattc tgcgtgtcca tggcgggggt 1080
 tctccaayac actcacactg tccatgttct ttttattgcc agggcccgtg ttgaagtgtc 1140
 aagagagcaa tcatcaatga taatgtattg tgtgagacct ttgcatcttg taaattttct 1200
 cttttttcta aaaataaata ataataaaat cctaaatctc aacaaa 1246

<210> 58
 <211> 1966
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (1926)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1942)
 <223> n equals a,t,g, or c

<400> 58
 gggagaaaga tccttcactc acagaaccag ttattagggg gttaatgaaa ttttggccta 60
 aaacatgtag tcaaaaagag gtcattgttc ttggggactg gaagaaatat tggatgtgat 120
 tgaaccttca caatttggtt aaatccaaga accttggttt aaacaaatcg ccaagtgtgt 180
 atctagcccc cattttcagg tggcagaaag agcactctat tattggaata atgaatacat 240
 catgagtttg atagargaaa actctaactg catccttccc atcatgtttt ccagccttta 300
 taggatttca aaagaacatt ggaatccggc tattgtggcg ttggtgtaca atgtgttgaa 360
 ggcatttatg gaaatgaaca gcacatgtt tgacgagctg acagccacat acaagtcaga 420

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tcgtcagcgt gagaaaaaga aagaaaagga gcgtgaagaa ttgtggaaaa aattggagga 480
tctggagtta aagagaggtc ttagacgtga tggataaatt ccaacttaac aaaaacaatg 540
acaacaacat tactaacctg tggagtcaca cgtttatgta gtagaagatg gagcaacagt 600
tttctgtatt gtgcaacttt acagtagatt tcacctttgt ttcattatta cagcagcact 660
gtatatacct gtctctaagt aaaggaaaaa acaaaataag gacttcaatc caaagtttgg 720
acagtagatg gacttctcag aactttgcaa acataatcat tgttctcacc ctctttttaa 780
aaaaaaaaatc ggtcttcaaa gatctgttga tgaaattgct atgtttaa atccattatcg 840
ggagttcctt atttatcact agcagagagt atgatacaat tttcaa atgt gaacaatctt 900
aaatttagct tgtctttctg ctaagctgtt aaatgtattt atagtaaagg aagaaaaaaa 960
gactgtcatt tccttataag tttgtgtaac atcctcctct ggataacttg actgtaattt 1020
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tagtagggaa gggaatatcg gattcatgca tcagtttatg gtgaatccaa atcaatgtct 1260
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tgcatatatac attgaacaca cataccagag atgtttttaga aatgtgagaa aaacatcctt 1380
ttggaccatt tgaaataaga aagacaaaaca ctaaacaata caaccatgaa attgatcacc 1440
gggattgcaa atctaattgg gaaaagagtt gagcaaacag cttggactgt ttggagttgt 1500
tgcccttactt ttaatatgt atttataaag tattccagca aaagaggatg tagcctctgg 1560
gaaaaaacia acatgttaca gtgttttttg tagattctcg ttctatatct catcacagcg 1620
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aaatctggaa attccta atctgagtat taataataaa gtttaaaaaat gcttttatat 1800
caaaggtgca tcgtgaccaa attgttttaa aaaaaaaaaa aaaaaaaca aaatctaggg 1860
ctgtattttta tatatatata tatatatata tatatatata tatatatata tatatatgct 1920
cttatnggac tctctgcttt gntattttaa taaaaaatct tacatc 1966

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<210> 59

<211> 1611

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (7)

<223> n equals a,t,g, or c

<400> 59

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aaggtagagt caattatgaa gaggacagct ttggtagcca atacctccaa tatgcctgtt 120
gctgctagag aagccyctat ttatactgga atcacactgt cagagtactt ccgtgacatg 180
ggctatcatg tcagtatgat ggctgactct acctctagat gggctgaggc cttagagaaa 240
tctctggctg tttagctgaa atgcctgcag atagtggata tccagcctat cttgggtgcc 300
gtctggcctc gttttatgaa cgagcaggca gggtgaaatg tcttggaat cctgaaagag 360
aaggagtggt cagcattgta ggagcagttt ctccacctgg tggtgatttt tctgatccag 420
ttacatctgc cactcttggt atcgttcagg tgttctgggg cttagataag aaactagctc 480
aacgtaagca tttccctct gtcaattggc tcatcagcta cagcaagtat atgcgtgcct 540
tgatgaata ctatgacaaa cacttcacag agttcgttcc tctgaggacg aaagctaagg 600
aaattctgca ggaagaagaa gacctggcag aaattgtaca gcttgaggga aaggcttctt 660
tggcagaaac agataaaatc actctggagg tagcaaaact tatcaaagat gatttcctac 720
aacaatatgg atatactcct tatgacaggt tctgcccatt ctacaagaca gtagggatgc 780

```

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tgtccaacat gattgcattt tatgatatgg ctctagatag gtttgaaacc actgcccaga 840
gtgacaataa aatcacatgg tccattattc gtgagcacat gggagacatc ctctataaac 900
tttcctccat gaaattcaag gatccactga aagatgggtga ggcaaagatc aaaagcgact 960
atgcacaact tcttgaagac atgcagaatg cattccgtag ccttgaagat tagaagcctt 1020
gaagattaca actgtgattt ccttttcctc agcaagctcc tatgtgtata ttttcctgaa 1080
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ctttcctcat ctctattaaa ttgtaaacag gactactgca tgtactctct ttgcagtga 1380
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tttctattgt ggtaagctca ttggcagctt agcattttgc aaaggaattg ctttgcagga 1500
aatatttaat tttcaaaaac ataatgatta atgttccaat tatgcatcac tccccccagk 1560
ataaaycagg aatgkttgtg agaaaccatt gggaactata ctctttttta a 1611

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<210> 60

<211> 1849

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (100)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (977)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1846)

<223> n equals a,t,g, or c

<400> 60

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agacctcagt cacctattac cggttggagg aggtggcaaa gcgcaactcc ttgaaggaac 180
tgtggcctgt gatccatggg cgagtctacg atgtcaccg cttcctcaac gagcaccctg 240
gaggagaaga ggttctgctg gaacaagctg gtgtagatgc aagtgaagc tttgaagatg 300
taggacactc ttctgatgcc agagaaatgc taaagcagta ctacattggg gatatccatc 360
cgagtgcctt taaacctgaa agtggttagca aggacccttc aaaaaatgat acatgcaaaa 420
gttgctgggc atattggatt ttacccatca taggcgctgt tctcttaggt ttcctgtacc 480
gctactacac atcggaaagc aaatcctcct gaggaggcct tgctgaagtt agaaagtgc 540
tccacttttg ggcgaaaact agagacttgc ttgggggctg cagaagtgcc ctctcctcga 600
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ccgtgttgaa caattgccgg tgtttcctct cttcactggg ttccatgagt acccttatat 780
ttcacaactt tctgttcata agttatagt acattgctct ttggtaaaaa tgcctgcttt 840
ccaatacttt gattgcatat tagacattct taacagggcg gcagtctagt gttgaaagtt 900

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ttatttttcc atttttcttt taagtaaatt ttttttaaaa aattctgatt tagggctagg 960
tgtggtggct caggccngta atcckggcac ttkgggrggc caaggtggga agatcgsttg 1020
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aagtgaagat tcatgacaac agaccgtttt ccatttcatc tgtattttat ctccgtgact 1740
ccaacttggt gggtttgttct gtttttccat gagaataaaa tactggcggt ttttttcaaa 1800
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aagggnnga 1849
```

<210> 61
<211> 233
<212> DNA
<213> Homo sapiens

<400> 61
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taaaaatttt ttaatcttga gaaraaacat acagktcata catataaaaa gccttgaaaa 120
tattattccc ttgactcac taattacact gctggaatat aaagaaatga tcctaaatat 180
atatgtagtt ttatggtcct aaatatgtat aaagctttat gatcactcgt gcc 233

<210> 62
<211> 2333
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (3)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (6)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (7)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (14)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2327)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2331)

<223> n equals a,t,g, or c

<400> 62

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ggtgcaatcc agtttgtgac tcagtatcag cattcaagtg ggcagagacg catccgagtg 180
accaccattg ctaggaactg ggcagatgct caaactcaaa tccaaaacat tgctgcatct 240
tttgaccagg aggcagctgc cattcttatg gcccggttag caatatatag agcagaaaca 300
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tatccacagt ttatgtttca tttagaaga tcttctttcc tgcaagtttt taacaatagt 480
cctgatgaga gttcatatta tcgtcaccat tttatgcgtc aagatctgac ccagtctcta 540
attatgattc agcctatcct gtatgcgtat tcttttagtg gaccaccaga gccggttctt 600
cttgatagca gtagcattct tgcagatcgt attcttctca tggacacatt cttccagatt 660
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gagtatgaaa atttccgcca ccttctgcaa gccccagtg atgatgcaca ggaaattctt 780
cactccagat ttccaatgcc aagatacatt gacactgaac atggaggcag ccaggcccgt 840
ttcctccttt caaaagtcaa cccttcacag actcataata atatgtatgc ctgggggcag 900
gagtctggag cacctattct tacagatgat gttagtttac aagtgtttat ggatcacttg 960
aagaaacttg ctgtgtccag tgctgcttga agtgctaata atgttaaaga cacttaagaa 1020
gatgaaataa tattcaaatt tcattttttc ctttttccat ttatctgtgg aaaccaacag 1080
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gttttcccct tgtttttcag aggtaaattt tgcattatat ccttcagtat tttaacacta 1860
ttttggcagt ttacacatta ctttttggtt ttccttcctt tttgtgaaat gtattaagtt 1920
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tcaattagct taaataagtt gctttgttat attttatttg aattgaacta cgctaggcct 2280
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<210> 63

<211> 1470

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1410)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1414)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1419)

<223> n equals a,t,g, or c

<400> 63

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<210> 64

<211> 939

<212> DNA
<213> Homo sapiens

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<222> (3)
<223> n equals a,t,g, or c

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<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (11)
<223> n equals a,t,g, or c

<400> 64
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<210> 65
<211> 2068
<212> DNA
<213> Homo sapiens

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<221> misc feature
<222> (308)
<223> n equals a,t,g, or c

<400> 65
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<210> 66

<211> 1391

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (1)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (16)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (20)

<223> n equals a,t,g, or c

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 <222> (27)
 <223> n equals a,t,g, or c

<220>
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 <222> (1343)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1358)
 <223> n equals a,t,g, or c

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<210> 67
 <211> 659
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (139)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (475)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (585)
 <223> n equals a,t,g, or c

<400> 67
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<210> 68
 <211> 2981
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (2858)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (2948)
 <223> n equals a,t,g, or c

<400> 68
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<210> 69

<211> 603

<212> DNA

<213> Homo sapiens

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<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (590)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (595)
<223> n equals a,t,g, or c

<400> 69
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<210> 70
<211> 1101
<212> DNA
<213> Homo sapiens

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<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1080)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1081)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1090)
<223> n equals a,t,g, or c

<400> 70

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<210> 71

<211> 714

<212> DNA

<213> Homo sapiens

<400> 71

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tgctgccatt tttattggtg tttgattatt ggaatgggtc catattgtca ctccttctac 660
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<210> 72

<211> 2890

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (555)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2853)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2882)

<223> n equals a,t,g, or c

<400> 72

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<210> 73

<211> 2488

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (277)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (446)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2382)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2412)

<223> n equals a,t,g, or c

<400> 73

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```

<210> 74

<211> 711

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (696)

<223> n equals a,t,g, or c

<400> 74

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tcccaccgat gtccctcagc ttcacttac cctccaggag aatgaagaat ccctccattg 180
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ttgaagcagc aggtccagggt cactttgtat atagaatttt gctgtattca ataaatctgt 660
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<210> 75
<211> 906
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (4)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (362)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (889)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (894)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (897)
<223> n equals a,t,g, or c

<400> 75
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tgccctctg agcctcagtc ttctgccagt gacgcagga gacggcactg actgcctccc 180
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cttaca 906

<210> 76
<211> 271
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (36)
<223> n equals a,t,g, or c

<400> 76
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tcagccaggga gaatatcatt aaaagaggga gaagggaaaa cagacttttt gtgtggtaca 120
aaaacaaaac cctctgtatc attatgtgaa caacggtgca aaaaagaggga gacacagttt 180
acccatgggt agctaactat gatagtgaag gttgccttga accttgtttt agaaaaatgg 240
caagtgtggg tctcactctt ctagttcctg a 271

<210> 77
<211> 673
<212> DNA
<213> Homo sapiens

<400> 77
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ggggggggcc cgg 673

<210> 78
<211> 367
<212> DNA
<213> Homo sapiens

<400> 78
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ttttctc

367

<210> 79

<211> 1344

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1319)

<223> n equals a,t,g, or c

<400> 79

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<210> 80

<211> 3748

<212> DNA

<213> Homo sapiens

<400> 80

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<210> 81

<211> 1891

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1869)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1879)

<223> n equals a,t,g, or c

<400> 81

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<210> 82

<211> 1954

<212> DNA

<213> Homo sapiens

<400> 82

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aaatttatta tttgctatac tgaaaaaaaa aaaa 1954

<210> 83

<211> 936

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (895)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (930)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (936)

<223> n equals a,t,g, or c

<400> 83

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aatggattct ttgcccataa agtggagcac gaaagcagga cccagaatgg gaggagcttc 180
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<210> 84

<211> 1513

<212> DNA

<213> Homo sapiens

<400> 84

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1513

<210> 85

<211> 1298

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (3)

<223> n equals a,t,g, or c

<400> 85

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1298

<210> 86

<211> 2009

<212> DNA

<213> Homo sapiens

<220>
<221> misc feature
<222> (1955)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1959)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2008)
<223> n equals a,t,g, or c

<400> 86
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<210> 87
<211> 534
<212> DNA
<213> Homo sapiens

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<222> (466)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (477)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (526)
<223> n equals a,t,g, or c

<400> 87
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<210> 88
<211> 4302
<212> DNA
<213> Homo sapiens

<220>
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<222> (1015)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (4270)
<223> n equals a,t,g, or c

<220>
<221> misc feature
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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (4296)

<223> n equals a,t,g, or c

<400> 88

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```

<210> 89

<211> 2782

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (82)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (743)

<223> n equals a,t,g, or c

<400> 89

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gaagcctggg aaacagctaa gccaattcct gctagaaggc aaaggagact ctttgatgat 180
acacgggaag cagaaaagggt gctgcactat ctggcaatcc agaaacctgc agaccttgct 240
cggcacctgt taccttgtgt gattcatgca gctgtactca aggtaaagga agaagaaagt 300
ctcgaaaaca tttcttcagt taagaagatc ataaagcaga taatatccca ttccagtaaa 360
gttttgcact tccccaatcc agaagacaag aaattggaag aaatcattca ccagattact 420

```

```

aatgtggaag ctctcattgc cagagctcgg tcaactaaaag ccaagtttgg aactgagaaa 480
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```

2782

<210> 90

<211> 1037

<212> DNA

<213> Homo sapiens

<400> 90

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aatgaaatta tatagattag atctcagtat ttaactgtt cctcaatttt gtgaggctgt 180
gttggaata acccgctct agtgctgttg gtatgcaagg cagcggtgct taatcaatat 240

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ttaaacagat cgcataattat gatcttgctg cagccacagt gcagctccac attaaactcta 420
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```

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<210> 91
<211> 1052
<212> DNA
<213> Homo sapiens

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```

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<221> misc feature
<222> (76)
<223> n equals a,t,g, or c

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<220>
<221> misc feature
<222> (962)
<223> n equals a,t,g, or c

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<220>
<221> misc feature
<222> (965)
<223> n equals a,t,g, or c

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<220>
<221> misc feature
<222> (1044)
<223> n equals a,t,g, or c

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<220>
<221> misc feature
<222> (1048)
<223> n equals a,t,g, or c

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gatgttctct ctccacagct gaaagatgaa aattctaagc tgagaagaaa gctgaatgag 180
gttcaragct tctytraagc wcaacagaa atgggtgagga cgcttgagcg gaagttagaa 240
gcaaaaatga atcaaggagg aaagcgacta ccacgacctg gagtcggtgg ttcagcaggt 300

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```

<210> 92

<211> 1234

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1115)

<223> n equals a,t,g, or c

<400> 92

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ccagaaaatt accaagtcta tgaaaatggt agcggcagca aaatatgccc gagctgagag 240
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```

<210> 93

<211> 1571

<212> DNA

<213> Homo sapiens

<220>
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<222> (1497)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1516)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1530)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1546)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1571)
<223> n equals a,t,g, or c

<400> 93
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gctttccctg ggtccggggg ctgccasgag ggascgggar gtctgtccac ctcacaaggc 120
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gtttgaatta ctaatagtgg ggaataataa tttcagtttt ggttttaaac atctggnatt 1500
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 aaaggggggg n 1571

<210> 94

<211> 1872

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (6)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (51)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1271)

<223> n equals a,t,g, or c

<400> 94

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ttgccatcgg ntcccagctg tctcctgaac aggggaagctc aggcattgag atgctggaga 1320
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cagatcctag gcaagctgga atagattctc ttctccgaaa gatttatgag atttactcag 1440
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ataccatggt cttactttcc aactctgtac agatttattt atggaggagc taggtccata 1800
aatgtgttaa taaatattcc ttgatcttg gtgtttgcaa aaaaaaaaaa aaaaaaaact 1860
cgagactagc gg                                     1872

```

<210> 95

<211> 1516

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1505)

<223> n equals a,t,g, or c

<400> 95

```

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gccgaatctc cctaattcct gtgacctgtg tcacctctgc atcgcgagga gggggataag 180
tggggagaa tctggtgtca gatgggatgg cgccggaaga gggtgccaca gcggggacgg 240
aaggcgcccc caccctaact ccacgggaat ataaacaatt tgtattttcc gatcagggtg 300
cgggacaggc ttcatgggga cagccctaac ccagctgctg aatgccagag gccacgaagt 360
acgttggtct cccgaaagcc cgggcccggc cggatcacgt gggatgagct cgctgcatcg 420
gggctgccga gctgcgatgc cgccgtcaac ctggccggag agaacatcct caacctctc 480
cgaagatgga atgaaacctt ccaaaaagag gttctcgga gccgcctaga gaccacccaa 540
ttgctggcta aagccatcac caaagcccca caaccccca aggcctgggt cttagtcaca 600
ggtgtagctt actaccagcc cagtctgact gcggagtatg atgaagacag cccaggaggg 660
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gattctacac gccagggtgt ggtgcgtcga ggggttgtgc tgggccgtgg ggggtgtgcc 780
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ttggtttctc tacatgtcct gcagctgcc cacttctcct ttacgctgtg tagagaatgc 1440
tctgcagttt aggcaataaa aataaattgt ctactaaaa aaaaaaaaaa aaattggggg 1500
ggggncccg acccat                                     1516

```

<210> 96

<211> 1770
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (485)
<223> n equals a,t,g, or c

<400> 96
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gtcggacatt gaagcggtag ccatgccggc agwgtgaaca gtccttccac accccaaca 120
gcctgcgcaa acacatccgc aacaaccatg acacagtaaa gaagttctac acctgcgggt 180
actgcacaga ggacagcccc agctttcctc ggccctccct tctggagagc cacatcagcc 240
ttatgcatgg catcagaaac cctgatttga gccagacgtc caaagtgaaa cctccgggtg 300
gacattcccc tcaggtgaac catctgaaaa gaccagtcag tggagtgggg gacgctccag 360
gcaccagcaa tggcgcaact gtctcttcca ccaaaaggca caagtccctt ttccagtgcg 420
cgaaatgtag ttttgccaca gactcggggc tcgagtttca gagccacata cctcagcacc 480
aggtnggaca gytccacagc ccaatgtctc ctctgtggtt tgtgctacac ctctgccagc 540
tccctcagcc gccacctctt cattgtccac aaggtgagag accaggagga ggaggaggaa 600
gaggaggcgg cggcacggag atggcagtg aggtggcaga gcagaggagg gctccgggga 660
rgargtgccc atggagacta gagagaatgg actggaagaa tgtgccggtg agccyttgtc 720
agctgaccca gaggcgagga gattgctggg cccggccccct gaggacgatg gtggccacaa 780
tgatcacakt caaccacagg cytytcagga ccaggacagc cacacactgt cccctcaggt 840
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cctgcggacc gtggaaaata aaaggctctg cccccagtgt gagtgtgacc ggttgtaccc 960
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gagcaggagg taaggcaaaag gcaggcaggc accaagaacc agacccttg agaaggcgtc 1560
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tctcaccatg caggtaggct cttgtattcc 1770

<210> 97
<211> 938
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (183)
<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (293)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (360)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (938)

<223> n equals a,t,g, or c

<400> 97

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ratggagagc agagggagag ggccaggctc caractccca cagcccaca cagcacctct 120
gccaggccta ggagaagaca ggtgcagctc ttgcagctct gcgggtgtgc ggccaaaggc 180
aangcccacg ggctggatgt cacttccccg actgtctctt ggttggcttg tccttgtgca 240
agaccacgcs tgtcacgaca garcctgggc acttcagagg aggagccagg ttngaattgt 300
aaggggggaa ttgggtcca ccatagtctt ctgctctggt cctccacggg tgggaccagn 360
atggaagtct cctgcctaac ctactgcat tgcactggac ctgggatgcc tatccacct 420
ctggcagaag aactcacca gggtatctgt gaagagactc tgggatccca tcacctcaa 480
gccagagggg cccaagtca ccgctgagag cacttgagcc tcaaggatgt aagcctgacc 540
ataggatctt gactccaaca gcggcaacc ccaccccat tgtggtccgt ccttaaccca 600
tccactcttc ttcgaggca actgagaaca cataaagcaa gcagctacct agcatcccc 660
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ttcctattaa aggaccttct gaagggcaaa aaaaaaan 938

```

<210> 98

<211> 311

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (297)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (309)

<223> n equals a,t,g, or c

<400> 98

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agatgcggct ggagcagcag aagcagacgg tccagatgcg cgcgcagatg cccgccttcc 60
ccctgcccta cgcccaggca tgtgccatcc tcccgccacc cagaggtttg tgggctgagg 120

```

```

accaactctc accgctgtct ctttcgtccc cagctccagg ccatgccgcg agccggaggt 180
gtgctctacc agccctcggg accagccagy ttccccagca ccttcagccc ygccggctcg 240
gtggagggct cccaatgca cggcgtgtac atgagccagc cggtccttgc cgctggcccc 300
taccacagna t                                     311

```

<210> 99

<211> 620

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (368)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (570)

<223> n equals a,t,g, or c

<400> 99

```

actgccggtc gttcggacgt cttgcctgtc gctggaggag aggtccgggc tctccaggaa 60
ggtggctgcy gcgacaaaat gaagatattc gtgggcaacg tcgacggggc ggatacgact 120
ccggaggagc tggcagccct ctttgcgccc tacggcacgg tcatgagctg cgccgtcatg 180
aaacagtctg ccttcgtgca catgcgcgag aacgcggggc cgctgcgcgc catcgaagcc 240
ctgcacggcc acgagctgcy gccggggcgc gcgctcgtgg tggagatgtc gcgccaagg 300
cctcttaata cttggaagat ttctgtgggc aatgtgtcgg ctgcatgcac gagccaggaa 360
ctgcgcancct cttcgagcgc cgcggacgcg tcatcgagtg tgacgtggtg aaagactacg 420
cgtttgttca matggagaag gaagcagatg ccaaagccgc aatcgcgag ttcaacggca 480
aagaagtga gggcaagcgc atcaacgtgg aatctycacc aagggtcaga agaagggggc 540
tggcctggct gtccagtctt gggacaagan caagaaacca agggctgggg ataggccttc 600
cctggaatgg tggctttctg                                     620

```

<210> 100

<211> 2511

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (12)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (28)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (44)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2456)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2488)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2511)

<223> n equals a,t,g, or c

<400> 100

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gccagattcg gccgagcaag cggaacctct gggaaaagca atctgtggat aaggctactt 120
ccccactaa ggtttgagac agttccagaa agaaccacag ctcaagacgc aggacgagct 180
cagttgtaga gggctaattc gctctgtttt gtatttatgt tgatttacta aattgggttc 240
attatctttt atttttcaat atcccagtaa acccatgtat attatcacta tatttaataa 300
tcacagtcta gagatgttca tggtaaaagt actgcctttg cacaggagcc tgtttctaaa 360
gaaacccatg ctgtgaaata gagacttttc tactgatcat cataactctg tatctgagca 420
gtgataccaa ccacatctga agtcaacaga agatccaagt ttaaaattgc ctgcggaatg 480
tgtgcagtat ctagaaaaat gaaccgtagt ttttgttttt ttaaatacag aagtcatgtt 540
gtttctgcac tttataataa agcatggaag aaattatctt agtaggcaat tgtaacactt 600
tttgaaagta acccatttca gatttgaaat actgcaataa tgggtgtctt taaaaaaaaa 660
aaagaaatgt actgttaagg tattactttt ttcatgctg atgattcata tctaaattac 720
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cacatatata aacacactaa tggtagaatg cttttttatg tgctagacta ttatatattag 900
tagtatgtca ttgtaactag ccaatatcac agcttttgaa aaattaaaaa atcacactat 960
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cctgatgacc tataagaaga aagtattgaa aagaagagag attagaactg ttagaaggag 1080
ttgaaatfff ctaaaagaca tagtatattg tttataatta aatgcattct tgaagtccag 1140
tgtgaatfff attaatgcta tcatctcgac caagctcaaa gcctacttat tagaaacaat 1200
gaagttcaca ataggtcata aggtctcttc cttttctaaa attgaaagac aagaaattta 1260
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gaatcttcta gcttttagca acctaagcca aaggaaggaa agccacgaag aatgcagaag 1920
tcaaaccctc atgacaaagt aggcacaagt ctacaataag ctaaatcaga atttacaatt 1980
```

```

acaagtgtcc caggtagcat tgactcccggt cattggagtg aaatggatca aagtttgaat 2040
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cactattaca tttttttcta gaaaatctaa agttcagaag agaattgtatc actgctgact 2160
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catccacaat aaatggaatt ccttcctgca aaaaaaaaaa aaaaaagggc ggccgntcta 2460
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```

<210> 101

<211> 2981

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (293)

<223> n equals a,t,g, or c

<400> 101

```

cggacgcgtg ggcgggccacg ttgtcttgcg cgetttgccc gcctggccct gggactctga 60
ccctcggcta ccctttcctg cccactagc gtggccgcga gcctcgggta gccggccgta 120
ttcccgtctt cgettagggg gcacaggcgc aggcacggc ccggccactc caagccttcg 180
gtgcgcgggc gcgtctggga tacgggcccc ggaggcgccg ccctccgtcc gcccggtgcc 240
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ccggggccca tgcccggtgc ccccgccagg ccggcgccat ggccctccgg agtktgggcg 360
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accggcacct ggccaacgtg acccaactgg taaagcagct gcgcaccgag cggcgcgtcg 600
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gagctgaact cttgagccta acccagatgg agaggagaa gattgtttgg gagtttgagc 900
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gatgtttaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa g 2981

```

<210> 102

<211> 2804

<212> DNA

<213> Homo sapiens

<400> 102

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gaccactttt acaagagaag gatcattccg tgtcacaaca gccactgaac aagcagaaag 180
agaggagatc atgaaacaaa tgcaagatgc caagaaagct gaaacagata agatagtcgt 240
tggttcatca gttgcccctg gcaamactgc cccatcccca tctctccca cctctctac 300
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catcagctcc ctgtgctsac agatcaccaa tgccttcagc acacctgagg accccttctc 600
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gaccgagtgg ggtcaatctt ctggtgctgc ctctccaggt ctctccagg ccggtcatag 720
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<210> 103

<211> 722

<212> DNA

<213> Homo sapiens

<400> 103

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gccctgtggc tgggygcggg gggcgtgggc gtcgccgagc tcacggaagc ccagcgccgg 180
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<210> 104

<211> 1636

<212> DNA

<213> Homo sapiens

<400> 104

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```

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cccgcggtt ctgtggatat ctccatgctc agctctctgg ggaaggtgaa gaaggagctg 600
gaccctgacg acagccattt gaacttggat gagacgacga agctcctgca ggacctgcac 660
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gcctgggaaa ggagtgtgtt ctgcctgccc gttacagtgg agcgttccgt gtccataaaa 1560
cgttttctaa ctggraaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1620
aaaaaggggg gggggg

```

<210> 105

<211> 1561

<212> DNA

<213> Homo sapiens

<400> 105

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ggagaaacct cccaaaaaga aggccagga caaaattctt agtaatgagt atgaggagaa 120
gtatgacctc agccggccta ctgcctctca gctggaggac gagctgcagg tggggaatgt 180
tccccttaaa aaagcaaagg agtctaaaaa gcatgaaaag cttgagaaac cagagaagga 240
gaagaaaaaa aagatgaaga atgagaacgc agacaagtta cttagagtg aaaagcaaat 300
gaagaagtct gagaaaaaga gcaagcaaga gaaagagaag agcaagaaga aaaaaggagg 360
taaaacagaa caggatggct atcagaaacc caccaacaaa cacttcacgc agagtcccaa 420
gaagtcagtg gccgacctgc tggggctcct tgaaggcaaa cgaagactcc ttctgatcac 480
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gaagacttgg tagaccagcg tctcatcagc gagctgagga aagagtacgg aatgacctac 720
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aacttcctat ccaggttccg gtggaggagg aggttgctgg tgatctctgc tcctaacgat 960
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tactgagcag aaatatgtaa ccttagactc agccagtttc ctctgcagct gctaaaacta 1500
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t
1561

```

<210> 106

<211> 486

<212> DNA

<213> Homo sapiens

<400> 106

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catttgccaa aaatgagtct aagtgcattt actctcttcc tggcattgat tgggtgggtacc 120
agtggccagt actatgatta tgattttccc ctatcaattt atgggcaatc atcaccaaac 180
tgtgcaccag aatgtaactg ccctgaaagc tacccaagtg ccatgtactg tgatgagctg 240
aaattgaaaa gtgtaccaat ggtgcctcct ggaatcaagt atctttacct taggaataac 300
cagattgacc atattgatga aaaggcctt gagaatgtaa ctgatctgca gtggctcatt 360
ctagatcaca accttctaga aaactccaag ataaaaggga gagttttctc taaattgaaa 420
caactgaaga agctgcatat aaaccacaac aacctgacag agtctgtggg cccacttccc 480
aaatct
486

```

<210> 107

<211> 800

<212> DNA

<213> Homo sapiens

<400> 107

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gttcgtgcag gacggcatct tgctaccaaa ttgaatattt tagtacagca acattttgac 120
ttggcttcaa ctactattac aaatattcca atgaagggtg ttcgcatcta ggtggcgcca 180
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gaccttcctc ctgccttact aattttcttc taaatggtcg ttctgtttta ttggaacaac 360
cacgaaagtc aggttctaaa gtcattagtc atatgcttag tagccatgga ggagagattt 420
ttttgcacgt ccttagcagt tctcgatcca ttctagaagr tccaccttca attagtgaag 480
gatgtggagg aagrgttaca gactaccgga ttacagattt tgggtgaattt atgagggaaa 540
acagattaac tccttttcta gaccccagat ataaaatcga tggaagtctt gaggtccctt 600
tggaacgagc aaaagatcag ttagaaaaac ataccggtta ctggcctatg gatcatttca 660
caaaccacca tttttaacak gcaagcggta gttccattag ccagtgttat tgtggaaaaga 720
tcyctggaca gaggaagatg tggttwaaac ggtccaaaaa acatwttcca acttggttgg 780
ataaggggaa ggaaaaaagg
800

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<210> 108

<211> 1058

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (895)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1019)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1054)

<223> n equals a,t,g, or c

<400> 108

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cgggccccgc gcggggatcc ggctggaaga gagcgtacac ggctcgacag agtccggggc 180
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gcgcamcccc ggcccagccc agaccytaty ccttccttcc tgggctggar gtaktaacag 300
gatccactca ccctgcgag gcagcaccag aggagggctc cctggaggag gcggcaaccc 360
ccatgcccc aaggcaatggc cctggcatcc cccagggcct ggacagcact gacctcgacg 420
tccccacaga agctgtgaca tgccagcctc aggggaaccc ttgggctgca cccacttct 480
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aagccctct ccctggtcct ctctaccca cccntgtc 1058
```

<210> 109

<211> 1076

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (780)

<223> n equals a,t,g, or c

<400> 109

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tggaagcaga tgggattaaa tgagcgacga gactgggaga gtgccagaga gagacaccaa 120
gaggatgcag gtctgtctgc tatcagctat gccgctgccc gttgcgctgc agacccgctt 180
```

```

ggccaagaga ggcacacctca aacatctgga gcctgaacca gaggaagaga tcattgccga 240
ggactatgac gatgacacctg tggactacga ggccaccagg ttggagggcc taccaccaag 300
ctggtacaag gtgttcgacc ctccctgcgg gctcccttac tactggaatg cagacacaga 360
ccttgatatcc tggctctccc cacatgaccc caactccgtg gttaccaaata cggccaagaa 420
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa waaaaaaatt ttgggggggg cccctt 1076

```

<210> 110

<211> 1199

<212> DNA

<213> Homo sapiens

<400> 110

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gttggtggag ttctgcccgg atggaagctc cggccgcgga gtgatggtgg cctcagcgaa 60
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ggtagaggag gctgtggtcc tcaggggggt gttaggtggag gtatggctcg ggccagcagc 180
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<210> 111

<211> 3630

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (3606)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3608)

<223> n equals a,t,g, or c

<400> 111

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cgcccgctcc tcgctgcgct tcgcctccgc ctccctcgac tcggactcgg gtttatatcg 180
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aacgacagaa gatacaaaa agttgcaatc aaagatctct tcactttatt gataaagcca 300
ctaataagcc aaaatgtctg tcaatgtcaa ccgcagcgtg tcagaccagt tctatcgcta 360
caagatgccc cgtctgattg ccaagggtga gggcaaaggc aatggaatca agacagttat 420
agtcaacatg gttgacgttg caaaggcgct taatcggcct ccaacgtatc ccaccaaata 480
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caatggatct catgagcgca ataagctgca agacatgttg gatggattca ttaaaaaatt 600
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gtttgttctg taatgccttt tacatttggg cacatagttt atsccttttt ttggtgtaag 2640
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<210> 112

<211> 1526

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1496)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1511)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1512)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1515)

<223> n equals a,t,g, or c

<400> 112

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tcgacccacg cgtccgcagc aggccctgcg cgcggcaaca tggcgggggc cagggtggagg 60
tcttgaggct atcagatcgg tatggcattg gcgtccgggc ccgcaaggcg ggcgctagct 120
ggctccgggc agctcggcct tgggggcttc ggggccccga gacgcggggc gtatgagtgg 180
ggcgtgcgct ccacgcggaa gtcggagcct cctccccctg ataggggtga cgagatccct 240
ggactggagc ccatcacctt tgcgggggaa atgcacttcg tgccctggct ggcgcgggcc 300
atctttccgc cctgggaccg cggctacaag gacccaaggt tctaccgctc gccccctctt 360

```

```

cacgagcatc cgctgtacaa agaccaggcc tgctatatct ttcaccaccg ttgccgcctt 420
ctcgagggtg taaagcaggc cctctggctc accaagacca agttaataga aggccttccc 480
gagaaagtgc ttagccttgt tgatgatcca aggaaccaca tagagaacca agacgagtgc 540
gttctgaatg tgatctctca cgcccgtctc tggcagacca ctgaggaaat cccaagaga 600
gagacctact gcccggtcat cgtggacaac ctaatacagc tgtgtaaatc tcagattctc 660
aagcatcctt ctctggccag gaggatctgt gtccaaaact ccacgttttc tgctacctgg 720
aaccgagagt ctcttctcct tcaagtcctg ggttctgggt gagcccgact gagcactaag 780
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ggccgctcaa nnggncccaa gttagt 1526

```

<210> 113

<211> 585

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (422)

<223> n equals a,t,g, or c

<400> 113

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tggtgttggt attaggagat ctgcacatcc cacaccgggt caacagtttg ccagctaaat 120
tcaaaaaact cctggtgcca ggaaaaattc agcacattct ctgcacagga aacctttgca 180
ccaaagagag ttatgactat ctcaagactc tggctggtga tgttcatatt gtgagaggag 240
acttcgatga gaatctgaat tatccagaac agaaagttgt gactgttgga cagttcaaaa 300
ttggtctgat ccatggacat caagtatttc catggggaga tatggccagc ttagccctgt 360
tgcagaggca atttgatgtg gacattctta tctygggaca cacacacaaa tttgaagcat 420
tngagcatga aaataaattc tacattaatc caggttctgc cactggggca tataatgcct 480
tggaacaaaa cattattyca tcattgtgtt gatggatata caggcttcta cagtggkcac 540
ctatgtgtaa tcagctaatt ggagatgaag tgaaagtaga acgga 585

```

<210> 114

<211> 501

<212> DNA

<213> Homo sapiens

<400> 114

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gatgaaaaga aggtttttgc tcttcaaatg cttaagtaaa ctaaaaggca gagctggaaa 60
taaagcccgt attgtggact ccaagtaatg ctctttctgc tacaccatac tttgtggtgt 120

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ctgctcccat gtgcttcttc gctaaggctg atcaaaaaag ttagtaggtt gcttcagcta 180
taagaatttg atggtcttcc ttagtcatca tagtctgcag caatcatttt tggtcatcat 240
tgggatgtct gcttactcct gttgagtaaa tgtgatctat tcacccttgg ragctccttg 300
cacaccaaca gtattcttgg atagggacaa gtgttgctta agtcagtgac gatttcttta 360
gcataataaa aggcctccatg taggatgcta atacttgagt gaaatatgct tcataagcag 420
ccttgttttg acagagttgg tgtaaagtga gggtatgtct tggcctgagc gtcttcaaag 480
catgtgccac tttgtgcatc t 501

<210> 115

<211> 1965

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (338)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (343)

<223> n equals a,t,g, or c

<400> 115

agaggcggca ctggcggcaa gagcagacgc ccgaaccgag cgagaagagc ggcagagcct 60
tateccctga agccggggccc cgcgtcccag mcctggccca aaggcaggag cagcagacaa 120
gagtgcagtg gtggctgccg ccgcaccagc ctcagtggca gatgacacac cccccccga 180
gcgtcggaac aagagcggta tcatcagtga gcccctcaac aagagcctgc gccgctcccg 240
cccgtctctc cactactctt cttttggcag cagtgggtgt agtggcgggtg gcagcatgat 300
gggcggagag tctgttgaca aggccactgc ggctgcancc tgnccctcct gttggccaat 360
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agtgggtgctg tggccagcct gctgagcaag gcagagcggg ccacggagct ggcagccgag 480
ggacagctga cgctgcagca gtttgcgagc tccacagaga tgctgaagcg cgtgggtgag 540
gagcatctcc cgctgatgag cgaggcgggt gctggcctgc ctgacatgga ggctgtggca 600
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ccaggcctct tcattatgac cccggcagggt gtgttccctg ccgagagcgc gctgcacatg 720
gcgggccttg ctgagtaccc catgcaggga gagctggcct ctgccatcag ctccggcaag 780
aagaagcggg aacgctgcgg catgtgcgag ccctgccggc ggcgcacatc ctgcgagcag 840
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gaactcaaaa agaagccttc cgctgctctg gagaagggtg tgcttccgac gggagccgcc 960
ttccggtggt ttcagtgcag gcggcggaac ccaaagctgc cctctccgtg caatgtcact 1020
gctcgtgtgg tctccagcaa gggattcggg cgaagacaaa cggatgcacc cgtctttaga 1080
accaaaaaata ttctctcaca gatttcattc ctgtttttat atatataatt tttgttgtcg 1140
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tccgaccatg aaatagtgc tagtttgcct ggagaatcca ctcacgttca taaagagaat 1500
gttgatggcg ccgtgtagaa gccgctctgt atccatccac gcgtgcagag ctgccagcag 1560
ggagctcaca gaagggggagg gagcaccagg ccagctgagc tgcacccaca gtcccagagac 1620

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tgggatcccc caccccaaca gtgatttttg aaaaaaaaaat gaaagttctg ttcgtttatc 1680
cattgcgatac tggggagccc catctcgata tttccaatcc tggctacttt tcttagagaa 1740
aataagtcct ttttttcttg ctttgctaata ggcaacagaa gaaagggctt ctttgcgtag 1800
tcccctgctg gtgggggttg tcccagggg cccctgctgc ctgggcccc ctsccacggc 1860
cagcttcttg ctgatgaaca tgctgtttgt attgttttag gaaaccaggc tgttttgtga 1920
ataaaacgaa tgcatgtttg tgtcacgaar maaaaaaaaa aaaaa 1965

```

<210> 116

<211> 1060

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (299)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1060)

<223> n equals a,t,g, or c

<400> 116

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gaaacacata cattggatat gggaagatgg cggctgtgtc ggtgtatgct ccaccagttg 60
gaggcttctc ttttgataac tgccgcagaa tgccgtcttg gaagccgatt ttgcaaagag 120
gggatacaag cttccaaagg yccggaaaac tggcacgacc atcgctgggg tggctctataa 180
ggatggcata gttcttgagg cagatacaag agcaactgaa gggatgggtt ttgctgacaa 240
gaactgttca aaaatacact tcatatctcc taatatattat tgttgtgggt ctgggacanc 300
tgcagacaca gacatgacaa cccagctcat ttcttccaac ctggagctcc actccctctc 360
cactggccgt cttcccagag ttgtgacagc caatcggatg ctgaagcaga tgcttttcag 420
gtatcaaggt tacattggtg cagccctagt tttaggggga gtagatgtta ctggacctca 480
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tggctccttg gcagcaatgg ctgtatttga agataagttt aggccagaca tggaggagga 600
ggaagccaag aatctggtga gccaagccat cgcagctggc atcttcaacg acctgggttc 660
cggaagcaac attgacctct gcgtcatcag caagaacaag ctggattttc tccgcccata 720
cacagtggcc aacaagaagg ggaccaggct tggccggtac aggtgtgaga aagggactac 780
tgcagtcctc actgagaaaa tcaactcctc ggagattgag gtgctggaag aaacagtcca 840
aacaatggac acttcctgaa tggcatcagt gggtaggttg ccgcggttct ggaaggtggt 900
gagcattgag gcccagtaag aactcatgt ggctagtgtt tgccgaatga aactcaactc 960
ataaaaaaac aaaaaccaa ttgggcagct gaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1020
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1060

```

<210> 117

<211> 709

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (174)

<223> n equals a,t,g, or c

<400> 117

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aattcggcac gagaacatcc attctaaagg gctactgtcc caaatcctgt gtgtcctttt 60
gacttgctctg atcacccaat ggaagtggat acttgtaaag tctacaccac tgtacttggc 120
gttaaatctt gctgaattcg tggtaagctg ttaccatgtc tacattttgt agantgattt 180
tggctctgcag caaaattcga ttctacttct cataccctt tccttccact tgaaatgcaa 240
tttagacaga ggccctgtgg tgaaagtgtc aatattaagt ttmcccttag aagatcccyt 300
cctcaaacct cagaaccctt agcagtgtta ccctwaaaca aaaatgagct cgagaaaaaa 360
gtagctcagt tacagagaag caaatcgagt tatttcccca cataaaaagt ttccccagat 420
tctaagaatt gcagtatcct gtaccctaaa atttttcaag gtgactcctg ttgtcgtctg 480
ttgataactt taataaaggc catttaagga cataagtttt taaagactcc caaagtgaaa 540
cttaaacatt ttcgggatta tcgattgcat atatcagttt atgctgtgtg ctgaattact 600
atgccatgtg ctatttttagt gtttggggaa aatgaaaaat aaaatttgtt ctttagctta 660
ataaatatgt cttattttta aaaaaaaaaa aaaaaactcg agactagct 709

```

<210> 118

<211> 2053

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (813)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2049)

<223> n equals a,t,g, or c

<400> 118

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ctccttggcg cctgtcccca cggccccgc agcgtgacca cgatgctccc cataccccac 60
ccattcccga tacaccttac ttactgtgtg ttggcccagc cagagtgagg aaggagtgtg 120
gccacattgg agatggcggg actgagcaga catgccccca cgagtagcct gactccctgg 180
tgtgtccttg gaagggaagat cttggggacc cccccaccgg agcacaccka rggatcatct 240
ttgcccgtct cctggggacc ccccaagaaa tgtggagtcc tcggggggccg tgactgatg 300
cggggagtgt gggaaagtctg gcggttggar ggggtgggtgg ggggcagtgg gggctgggcg 360
gggggagttc tggggtagga agtgggtccc ggagattttg gatggaaaag tcaggaggat 420
tgacagcaga cttgcagaat tacatagaga aattaggaac ccccaaattt catgtcaatt 480
gatctattcc ccctctttgt ttcttggggc atttttcctt tttttttttt ttttgttttt 540
tttttaccct tccttagctt tatgcgctca gaaaccaa ataaaccccc ccccatgtaa 600
caggggggca gtgacaaaag caagaacgca cgaagccagc ctggagacca ccacgtcctg 660
cccccgcca tttatcgccc tgattggatt ttgtttttca tctgtccctg ttgcttgggt 720
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agggttgcttg ggccccggag cccacgggtc tggatgatgcc atagcagcca ccaccgcggc 1260
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gagccaaatt gtcacaattg tggaaaccac attggcctga gatccaaaac gcttcgaggc 1560
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cttgggtccc ctcctctgcc atcacctgaa gacccccacg ccaaactg aatgtcacct 1860
gtgcctgcc cctcgggtcca cttggggccc gtgtttgact caactcagct cctttaacgc 1920
taatatttcc ggcaaaatcc catgcttggg tttgtcttt aacctgtga cgcttgcaat 1980
cccaataaag cattaaaagt catraaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 2040
ggggggggnc cgg 2053

<210> 119

<211> 1824

<212> DNA

<213> Homo sapiens

<400> 119

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caacatcttt agaaactcag gatgacgata acataagact gaaggaaaat acttttacca 120
tagaaaatga aaagtgttaa aatagcattt gctgttactc tggagacagt gctagccgg 180
catgaaaact gggtaaatgc agttcactgg caacctgtgt tttacaaaga tgggtgccta 240
cagcagccag tgagattatt atctgcttcc atggataaaa ccatgattct ctgggctcca 300
gatgaagagt caggagtttg gctagaacag gttcgagtag gtgaagtagg tgggaatact 360
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aaatgttttg caatgattaa tcggtttcag tttgtatctg gagcagatga aaaagttctt 720
cgggtttttt ctgcacctcg gaattttgtg gaaaattttt gtgccattac aggacaatca 780
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gaaataaatg actggaccca ctgtgtagaa acaagtcaaa gccaaagtca tacactggct 1680
atcagaaaat tatgtctggaa gaattgcagt ggaaaaactg aacagaagga agcagaaggt 1740

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aataaatgtg cactgtaatg gaaa 1824

<210> 120
<211> 606
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (144)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (155)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (598)
<223> n equals a,t,g, or c

<400> 120
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tcttccagtg ttttctcatg cmaaatttyc tyctarcatg tgataatgag taaactaaaa 120
ctatttgcag cttttcctca attnacattt tggtngtata ctccagagtg atgttatcta 180
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agcttttttaa aagttagtta aaagaattga gacacaatac taatactgta ggaattgggtg 420
aggccttgac ttaaaacttt ctttgtactg tgatttcctt ttgggtgtat tttgctaagt 480
gaaacttggt aaattttttg ttaactaaat tttttcttta aaataaagac ttttccacaa 540
wraaaaaaaaaa aaaaaaaaaa actcgagggg gggcccgtag ccaatcgctt gtgatgtntc 600
gtatac 606

<210> 121
<211> 838
<212> DNA
<213> Homo sapiens

<400> 121
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gccaccatct tgctgggtgg cacggaggat gctcttctgc agcagctggc ggactcgatg 180
ctcaaagagg actgcgcctc cgagctgaag gtccacttgg caaagtcctt ccctttgccc 240
tccagtgtga atcgccccg aattgacctg atcgtgtttg tggttaatct tcacagcaaa 300
tacagytcc agaacacaga ggagtccctg cgccatgtgg atgccagctt cttcttgggg 360
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<210> 122

<211> 656

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (41)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (218)

<223> n equals a,t,g, or c

<400> 122

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gcgtcctggc cgcagcggcg cgtgcctgg tccgggggtgc ggaccgaatg agcaagtga 180
cgagcaagcg gggcccgcgc agcttcaggg gccgcaangc ccggggcgcc aagggcatcg 240
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tcccggatct gaccggcttc aagctcaagc cctacgtgag ctacctcgcc cctgagagcg 360
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cacaggaggg aaagctcttc cagctctacc ccaggaactt cctgcgctag ctgggcgggg 540
gaggggaggc ctgcccctcat ctcatctcta ttaaagcgtt ttgccagcta aaaaaaaaaa 600
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaggggggg gggcggacgc gtgggc 656

<210> 123

<211> 1386

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (8)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1283)

<223> n equals a,t,g, or c

<400> 123

aaccgggnaa aaggaaaccg tggtgtgtac gtaagattca ggaaacgaaa ccaggagccg 60

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1386

<210> 124

<211> 845

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (823)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (825)

<223> n equals a,t,g, or c

<400> 124

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catcgtgggtg gactactgtg aaccctgctg cttcgaggcg acctacctgg agctggccag 180
tgctgtgaag gagcagtatc cgggcatcga gatcgagtcg cgcctcgggg gcacagggtgc 240
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ctatgagaaa gatctcattg aggccatccg aagagccagt aatggagaaa ccctagaaaa 360
gatcaccaac agccgtcctc cctgcgtcat cctgtgactg cacaggactc tgggttcctg 420
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aaagaaggaa tagaagattc cgtggccttg ggggcaggag agagacactc tccatgaaca 600
cttctccagc cacctcatat ccccttccca gggtaagtgc ccacgaaagc ccagtccact 660

```

cttcgcctcg gtaatacctg tctgatgcc aagatatttat ttattctccc ctaaccacag 720
gcaatgtcag ctattggcag taaagtggcg ctacaaacac taaaaaaaaa aaaaaaaaaa 780
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa atntnggggg ggggcccccc 840
cccccc 845

<210> 125

<211> 1656

<212> DNA

<213> Homo sapiens

<400> 125

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tgctgcagct ggaggagctc ccccgctgctg agggggctgc tgttgcagga ggccctggga 180
gcagtgccgg gccccacact cccartgcgg aggctgctga gccagaggcc agactggcgg 240
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aagataaaaa cgcccaaaaa aaaaaaaaaa aaaacc 1656

<210> 126

<211> 837

<212> DNA

<213> Homo sapiens

<400> 126

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aaaattccag ttattttatt ccaaaatgtt tggaaacagt ataatttgac aaagaaaaat 180
gatacttctc tttttttgct gttccaccaa atacaattca aatgcttttt gttttatttt 240
tttaccattt ccaatttcaa aatgtctcaa tgggtgctata ataaataaac ttcaacactc 300

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gccctcccta ttttaactac ctcaactggt cagaaacaca gattgtattc tatgagtccc 480
agaagatgaa aaaaatttta tacgttgata aaacttataa atttcattga ttaatctcct 540
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gtactttcac ttttaaactc tagatcagaa ttgttgactt gcattcagaa cataaatgca 780
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<210> 127

<211> 1217

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1168)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1169)

<223> n equals a,t,g, or c

<400> 127

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ttcgggaact cagagtttga ccccccgga cccaatgtgg ccaccaccac tgtcagtgc 480
gatgtctcta tgacgttcat caccagcaaa gaggacctga actgccagga ggaggaggac 540
cctatgaaca aactcaagg ccagaagatc gtgtcctgcc gcactctgcaa gggcgaccac 600
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cagctgggcc tgtctactgg cgagaaggag aagctgccgg gagagctaga gccggtgcag 720
gccacgcaga acaagacagg gaagtatgtg ccgcccagcc tgcgcgacgg ggccagccgc 780
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cactgtgtac tcggtccggg acccttggcg acagaagaca gcctccgaga gcgcgggctc 1140
caagggaat aaagcagctc cactctcna aaaaaaaaaa aaaaaaaaaa ggcgccgct 1200
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<210> 128

<211> 1349

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (57)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1133)

<223> n equals a,t,g, or c

<400> 128

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gctgaggaca tgacatccaa agattaactac tttgactcct acgcacactt tggcatccac 180
gaggagatgc tgaaggacga ggtgcgcacc ctcacttacc gcaactccat gtttcataac 240
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aaaaaaaaa aaaaaaaaaa aaaaaaaaaa                                     1349
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<210> 129

<211> 2318

<212> DNA

<213> Homo sapiens

<400> 129

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gcacggctcc gggtagccat ggaggacccc acgctctata ttgtcgagcg gccgcttccc 180
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aagctgggca aggcgcacgc accacgagca atacggtgag caagctgctg gagaagggtg 480
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gcaagggtcag cgtcaacgtg aagaccgtgc gcggcagcct ggagcgccag gcggggcaga 540
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ctctactaag cgaaaaccca tctctactaa aattacaaaa attagctggg catggttgcg 2220
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<210> 130

<211> 2149

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (787)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (819)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1518)

<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2116)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2147)
<223> n equals a,t,g, or c

<400> 130

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gccaggccaa attgagacat gtctgacaca agcgagagtg gtgcaggtct aactcgcttc 180
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<210> 131
<211> 1020

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (11)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1019)

<223> n equals a,t,g, or c

<400> 131

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ctgatgtcca aaagagcaaa gaatatttct ccaagcagaa gtgagcgctg ggctgtttta 720
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<210> 132

<211> 2319

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (10)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2246)

<223> n equals a,t,g, or c

<400> 132

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ttgggaccgg cggtgatgc aggatgacaa ccggggccta ggccaagggc tcaaggacaa 180
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caagagaacc tgcaaccggt tccgcctcct gctagagcgg cgaaccrtgg gcagttaggt 240
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gaacgccccg gcgctcgctc tgcctgtagc caggatgcag ctcccaggcc ctggtctgcg 360
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gctccagggt gaggaggaca ccctaccctc ggcggagacc gcactcatct tacaccgcaa 480
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ttcattcaca gagactgcct cttaacatga agatcattgg acaagccaca cgggtatccc 780
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<210> 133

<211> 1373

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (403)

<223> n equals a,t,g, or c

<400> 133

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ggtcgttggg gtcacttccg cgtcaccagc tcctgtgcct gccagtcggg gcccctcccg 120
ctccagccat gctctccgcc ctgcccggc ctgccagcgc tgctctccgc cgcagcttca 180

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gcacctcggc ccagaacaat gctaaagtag ctgtgctagg ggcctctgga ggcatcgggc 240
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aaggctacct cggacctgaa cagctgcctg actgcctgaa agnttgatgt gtggtagtta 420
ttccggctgg agtccccaga aagccaggca tgaccggga cgacctgttc aacaccaatg 480
ccacgattgt ggccaccctg accgctgcct gtgccagca ctgccggaa gccatgatct 540
gcgtcattgc caatccggtt aattccacca tccccatcac agcagaagtt ttcaagaagc 600
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ttttattttt caaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 1373

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<210> 134

<211> 1657

<212> DNA

<213> Homo sapiens

<400> 134

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gtaaaacaga ccatacagtaa catttcagga tttaatgaaa cctgcttgag atggagaagc 180
atcaagacag ctgatattga ggagatgtat ttattccaca tttggggcca gagatggtat 240
cagaaggaat ttgccagga aatgacctt aatatcagta gcagcagccg agatcccag 300
gtgtgcttgg acctacgtcc gggtagcaac tacaatgtca gtctccgggc tctgtcttcg 360
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gaatttttta cgggtgcacag aggacctca ccacgcctca gactgaggaa agccaaggag 480
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ttttcttgtg attctgaagg cgcttcctcc ttcttttagca acgcctctga tgcgtatgga 600
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tgctgtgtct gttaggcagc attgctttga tgcaatttct attgtcctat atattcaaaa 1560
gtaatgtcta cattccagta aaaatatccc gtaattaaaa aaaaaaaaaa aaaaaaaaaa 1620
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa ggcggcc 1657

<210> 135

<211> 2360

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1517)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2330)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2353)

<223> n equals a,t,g, or c

<400> 135

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attgacaaaa gcaatggtga tggagaagcc tagtcccctg ctggctcgggc ggggaatttgt 180
gagacagtat tacacactgc tgaaccaggc cccagacatg ctgcatagat tttatggaaa 240
gaactcttct tatgtccatg ggggattgga ttcaaatgga aagccagcag atgcagtcta 300
cggacagaaa gaaatccaca ggaaagtgat gtcacaaaac ttcaccaact gccacaccaa 360
gattcgccat gttgatgctc atgccacgct aaatgatggt gtggtagtcc aggtgatggg 420
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tgggctgggt ggtggaatga gaggccctcc ccgtggaggc atggtgcaga aaccaggatt 1500


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aactgttagt ttttttgaag tagttttttc cakgtttaat ttgtatttgg ttaaaaaaac 2280
maaaaggcca aaaattcccc aaaaccccgg ttaaccacca grgscaaacn gttgtggcct 2340
tcccaattaa cntgggatt 2360

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<210> 136

<211> 1042

<212> DNA

<213> Homo sapiens

<400> 136

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cccgccggcg ctgctgagtt tcttcatcta caaccgcgc ttcggggcgc gcgaaggaca 180
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tttgacgtca tgtgacctac ttgacatttt tgggtggaatc agcttcttcc cgttgataa 660
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<210> 137

<211> 1037

<212> DNA

<213> Homo sapiens

<400> 137

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gcggagcggg gccgcggggg cctctccagg gccgcagcgg cagcagttgg gcccccgcc 120
ccggccggcg gaccgaagaa cgcaggaagg gggccggggg gacccgcccc cggccggccg 180
cagccatgaa ctccaacgtg gagaacctac cccgcacat catccgcctg gtgtacaagg 240

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aggtgacgac actgaccgca gacccacccg atggcatcaa ggtctttccc aacgaggagg 300
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tggtccgcat gaaactcctg ctggggaagg acttccctgc ctccccaccc aagggctact 420
tcctgaccaa gatcttccac ccgaacgtgg gcgccaatgg cgagatctgc gtcaacgtgc 480
tcaagaggga ctggacggct gagctgggca tccgacacgt actgctgacc atcaagtgcc 540
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gcggggcccag cggcagggcc gaagccggtc gggccctggc cagtggcact gaagcttcct 720
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<210> 138

<211> 1490

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1225)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1239)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1348)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1452)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1487)

<223> n equals a,t,g, or c

<400> 138

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caagacagta aggattcaaa ccatttgcca aaaatgagtc taagtgcatt tactctcttc 120
ctggcattga ttggtggtac cagtggccag tactatgatt atgattttcc cctatcaatt 180
tatgggcaat catcaccaaa ctgtgcacca gaatgtaact gccctgaaag ctacccaagt 240
gccatgtact gtgatgagct gaaattgaaa agtgtaccaa tggcgcctcc tggaatcaag 300

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111

tatctttacc ttaggaataa ccagattgac catattgatg aaaaggcctt tgagaatgta 360
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agagttttct ctaaattgaa acaactgaag aagctgcata taaaccacaa caacctgaca 480
gagtctgtgg gccacttcc caaatctctg gaggatctgc agcttactca taacaagatc 540
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tttatttgta aatttagtgt ttttttantt ctacgtcaaa gatgtgcaaa accttttacg 1380
gttgaggaa acagccagtt ttaaaatcct taaacttaag ttcctcaagc tggataaaac 1440
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<210> 139

<211> 1684

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (93)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (201)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1657)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1659)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1682)

<223> n equals a,t,g, or c

<400> 139

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gagctggggc ctcgcccctc cctcgggcgg tcacctgggc acgggcgctg cagggtgctcg 180
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atgaagcagt gttttatcat gtgtatttca gcaggctctt ttgaaattta actaaaaata 540
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attttgact ttaagcatt aggttcaact aataccacat ctgcctattt actcaaatta 840
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cnac 1684
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<210> 140

<211> 427

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (395)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (417)

<223> n equals a,t,g, or c

<400> 140

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cctccaagcc tgctgccagc tccctgcaag cccctcagg tgggccttgc cacggtgcc 120
gcaggcagcc ctgggctggg ggtaggggac tccctacagg cacgcagccc tgagacctca 180
gagggccacc ccttgagggg ggccaggccc ccagtggcca acctgagtgc tgcctctgcc 240
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accagccctg ctggcccctg gttccgctgg cccccagat gcctggctga gacacgccat 300
ggcccttcag ctggcccaca cytyttcccg gsccttgaa kttggcaytg cagcagacag 360
ytccytgggc accagrcagy taacaggaca cagcngccag cccaaacagc agcgggnatg 420
ggggcag 427

<210> 141

<211> 889

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (60)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (698)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (889)

<223> n equals a,t,g, or c

<400> 141

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ccgttgggga aggattgaat acagagacgc tgtctgcttg ctgccttaag acagctagct 180
gaattgctga ttaactttta aaatacccag cttggtttat ttttcttaga atctgttgct 240
aagactgggg acgctgtttt cttttacaaa gggaaatcta agttaatttc aaggcattcg 300
aaatggggaa agactattat tgcatttttg gaattgagaa aggagcttca gatgaagata 360
ttaaaaaggc ttaccgaaaa caagccctca aatttcatcc ggacaagaac aaatctcctc 420
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atggacaagg aggtaccttc cggtacacct ttcattggcg tcctcatgct acatttgctg 600
catttttcgg aggtccaac ccctttgaaa ttttctttgg aagacgaatg ggtggtggtg 660
gagattctga agaatggaa atagrtggtg atcctttttag tgcccttggt ttcagcatga 720
atggatatcc aagagacagg aattctgtgg ggccatccc cctcaaacia gatcctccag 780
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aaagatttct cgaaaaagg taaaacgctg atggtaggag ttacagttt 889

<210> 142

<211> 1505

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1493)

<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1499)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1500)
<223> n equals a,t,g, or c

<400> 142
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acttcacgca gcaaaagcgc cccccgtcta tatcatatcg cctctcgggc ctcctaaaag 180
tcgtatgaga tggagctgga ggaggggaag gcaggcagcg gactccgcca atattatctg 240
tccaagattg aagaactcca gctgattgtg aatgataaga gccaaaacct ccggaggctg 300
caggcacaga ggaacgaact aaatgctaaa gttcgcctat tgcgggagga gctacagctg 360
ctgcaggagc agggctccta tgtgggggaa gtagtccggg ccatggataa gaagaaagtg 420
ttggtcaagg tacatcctga aggtaaattt gttgtagacg tggacaaaaa cattgacatc 480
aatgatgtga caccaattg ccgggtggct ctaaggaatg acagctacac tctgcacaag 540
atcctgccc acaaggtaga cccattagt tcatgatga tggtagagaa agtaccagat 600
tcaacttatg agatgattgg tggactggac aaacagatca aggagatcaa agaagtgatc 660
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gcagtagcca aggtcatgca gaaggacagt gagaaaaaca tgtccatcaa gaaattatgg 1380
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aangggggnn 1500
cccccc 1505

<210> 143
<211> 1235
<212> DNA
<213> Homo sapiens

<400> 143
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ctccgcggag gacccaggag agccggacta ggaccagggc cctgggcctc cccacactcc 180
ccatggagaa gctggcggcc tctacagagc cccaaggggc tcggccgggc ctgggcccgtg 240
agagtgtcca ggtgcccgat gaccaagact ttcgcagctt ccggtcagag tgtgaggctg 300
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ttgagacttt tgacatcgcc cgcttgacag tcaacgctga cgtgggctat tactcctgga 540
ggtgtcccaa gcccctgaag aaccgtgatg tcatcaccct ccgctcctgg ctccccatgg 600
gcgctgatta catcattatg aactactcag tcaaacatcc caaataccca cctcggaaaag 660
acttgggtccg agctgtgtcc atccagacgg gctacctcat ccagagcaca gggcccaaga 720
gctgcgtcat cacctacctg gcccgagggtg accccaaagg ctcccttacc aagtgggtgg 780
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agcagagccc gttgccgagc ctggcgctgt cggagctgtc ggtgcagcat gcggactcac 960
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gagacaggac cgggcgagcc ctggggcggc gccgctcct gcactttctc cctccccca 1140
cccggcacct ggtggcaccg ggccaggccc aggcgggtgc tgcagcctgg ctggacagag 1200
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<210> 144

<211> 1420

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1385)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1396)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1400)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1410)

<223> n equals a,t,g, or c

<400> 144

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gcaagaacgg agctgactga ggaaccaact ggagggtctt cactctctcc ttccccagtg 60
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actcacagcc catctgatct gttcaaagct gtcttttcca cctgctgaaa ttcattaaat 180
cactggaggc atgcataatg aatggagaat gagtgaactt ccaatgcaac ttggattcac 240
aaaccatta tcatagccaa tatgcagatt ttaaacagca tttcacattt catttgacca 300
tgtcttcttt ttcgcatcgc ctgctgcaga attccctact agaattgtgaa acaacgaaca 360
aaccacagaa cttagagtgt gctgggttagt cacataactt agtagcagga ttgtgtatcc 420
aggcacaaaag gtgtctttgc taatgttctc ttgtacctg cctgtcttca aacgctaaat 480
ggtatgggtc tttctttgtt gccagccata ttctacaaat aagacttttc aatatagtta 540

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tgagtaatat aattttatgt acatataatg ttagaatatt gtacagaatc ttggtttcta 600
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gttactgtcc ttaattttcc atagtttggt ttcttaattg tgctcactaa gcategatct 720
gtgctgatgc caagctatgg actatgtacg caagaccgag caatagacag aggtgcctag 780
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cttctgtgca gactttaaga gctgaacgtt ctggttcttg aagccatgtg actgcgagca 960
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cagtttgtcc agagtccttt aaatggaaac ccccaaatcc atcccttctt ttccctaacc 1380
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<210> 145

<211> 1919

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1882)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1898)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1919)

<223> n equals a,t,g, or c

<400> 145

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gggggagcggc tgggatggcg cgtccgggcc ccgskagtac aaagcgggcg acctggtctt 180
cgccaagatg aagggctacc cgcactggcc ggcccggatt gatgaactcc cagaggcgct 240
gtgaagcctt cagcaaacaa gtatcctatc ttcttttttg gcacccatga aactgcattt 300
ctaggtccca aagacctttt tccatataag gagtacaaag acaagtttg aaagtcaaac 360
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actgcagatg caagcagtga ggaagaaggt gatagagtag aagaagatgg aaaaggcaaa 540
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cagaaaacca gtgaagggtg ctaactacca taatgaatgc tgcatattaa gagaaaccac 780
aagaaggtta tatgtttggt tgtctaatat tcttggtatt gatatgaacc aacacatagt 840

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<210> 146

<211> 1379

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (925)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1371)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1377)

<223> n equals a,t,g, or c

<400> 146

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cgattctggc agaataaaca ggtgttttta gttttccac tgtctgagcc aagcaggacc 180
ctgtcccaga gcaagagatg tccccttcca tctctgacct ttgcctggga caagctttga 240
tgggggggccc cagcttcaag gctgtggtgg gaacagcacc ccctaatgcc agcctctcct 300
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atttctggtg ggatatgcct tccagtgcc cagggccact caccatgc atctctgtcc 420
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gggtactgcc tgggaaacct gtcctaagta aaactatgga cctcgccctg cccaccggcc 600
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acccttccag tacatccac agcgtgtcga gcagctggga gaacctgtgt caagctcgag 840
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cactgtgtag gctgcatctg tttcgtgctg gtcctgttga cttgtatgat atccacaaat 1320
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<210> 147

<211> 514

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (3)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (406)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (412)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (418)

<223> n equals a,t,g, or c

<400> 147

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tgttctgtaa gccacacagt atgcctgcag aagctgctta tcggagccaa atataattgt 180
cagtacaatt taaagaccac tatgtgtccc cggagaccaa cctgtttatt tccctgaaag 240
accgcaacac cccacacaac atgtttcaga catttgacc ttgttagata agacacttgt 300
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gacgcgtggg cggacgcgtg ggcggacgcg tgggcggacg cgtgggcgga cgcgtgggcg 480
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514

<210> 148

<211> 2058

<212> DNA

<213> Homo sapiens

<400> 148

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<210> 149

<211> 1781

<212> DNA

<213> Homo sapiens

<400> 149

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<210> 150

<211> 1709

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (1612)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1660)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1678)

<223> n equals a,t,g, or c

<400> 150

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<210> 151

<211> 922

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (906)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (915)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (922)

<223> n equals a,t,g, or c

<400> 151

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aaagatgttt ggttttcaca agccaaagat gtaccgaagt atagagggct gctgtatttg 240

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<210> 152

<211> 635

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (13)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (594)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (614)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (616)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (628)

<223> n equals a,t,g, or c

<400> 152

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<210> 153

<211> 2328

<212> DNA

<213> Homo sapiens

<400> 153

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<210> 154
<211> 1268
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (80)
<223> n equals a,t,g, or c

<400> 154
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<210> 155
<211> 4299
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (2813)
<223> n equals a,t,g, or c

<400> 155
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<210> 156

<211> 1006

<212> DNA

<213> Homo sapiens

<400> 156

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<210> 157

<211> 1686

<212> DNA

<213> Homo sapiens

<400> 157

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<210> 158

<211> 4147

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (13)

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<220>

<221> misc feature

<222> (292)

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<222> (4146)

<223> n equals a,t,g, or c

<400> 158

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<210> 159

<211> 1242

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1235)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1236)

<223> n equals a,t,g, or c

<400> 159

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<210> 160

<211> 2229

<212> DNA

<213> Homo sapiens

<220>

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (43)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (55)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (59)

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<222> (128)

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<220>

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<222> (301)

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<220>

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<222> (2226)

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<211> 1920

<212> DNA

<213> Homo sapiens

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<223> n equals a,t,g, or c

<400> 161
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tctytgaggt caggctgtgc tgtgtgaatg ggcaggcttt gccccagccc acccctggca 1560
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<210> 162

<211> 2619

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2546)

<223> n equals a,t,g, or c

<400> 162

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cttctccact ggctgggata ccccgggctc ggggcgcagt aataattttt caccatgcat 180
cggaaaaagg tggataaccg aatccggatt ctcatatgaga atggagtagc tgagcggcaa 240
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<210> 163

<211> 1419

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (230)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (624)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (697)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1187)

<223> n equals a,t,g, or c

<400> 163

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gaagtgggaag gggagccct ggctgcccc cagaccctaa ctytgccctc agcccttgag 360
gagctggagc aagagcagg gcccggagccc cacctgctaa ccaatggcga gaccaccag 420
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gggtgattagc ggtggcgcca gccntaggct acccttgcca aggcgcgcca cctgcatcag 660
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<210> 164

<211> 3810

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (189)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2523)

<223> n equals a,t,g, or c

<400> 164

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<210> 165

<211> 817

<212> DNA

<213> Homo sapiens

<400> 165

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tgtctgaagg caatagcagg cctcccatcc ctggaccgcc ttatgtggcc tccccgacc 180
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<210> 166

<211> 1578

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (16)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (38)

<223> n equals a,t,g, or c

<400> 166

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agattcatgg tttttaattg ctgcttttaa taacatttgt taaagttaaa aaaaaaaaaa 1560
aaatcttcgg gggggggg
1578

```

<210> 167

<211> 1694

<212> DNA

<213> Homo sapiens

<400> 167

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tcgcaccggc ttccgggtga ctgcttccta ctgctcgtgc tgctgctcta cgcgccagtc 180
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<210> 168

<211> 1636

<212> DNA

<213> Homo sapiens

<400> 168

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gtggaggaga tcagtctgct gcagccgagc gtggaggagt ccgtgctcaa cctgggcaaa 180

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<210> 169

<211> 667

<212> DNA

<213> Homo sapiens

<400> 169

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<210> 170

<211> 3598

<212> DNA

<213> Homo sapiens

<220>

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<223> n equals a,t,g, or c

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<221> misc feature

<222> (16)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (22)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (964)

<223> n equals a,t,g, or c

<400> 170

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<211> 940

<212> DNA

<213> Homo sapiens

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (12)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (919)

<223> n equals a,t,g, or c

<220>

<221> misc feature
<222> (935)
<223> n equals a,t,g, or c

<220>
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<210> 172
<211> 1458
<212> DNA
<213> Homo sapiens

<400> 172
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gtcaataackt ggtcttctat ggggtcaagaa acagttgaaa agttccggca gagaattctg 420
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<210> 173

<211> 2709

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2622)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2659)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2670)

<223> n equals a,t,g, or c

<400> 173

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<210> 174

<211> 1013

<212> DNA

<213> Homo sapiens

<400> 174

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gccagctccg gcctcatcct tgaagcacc aggggtggccg tgagggccag gatccctgca 840
cgctcagcc ctggctccag ctggcagcaa gcaccagca tgcctcccc acccagagga 900

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ttaaagactg gtcagacctg aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 1013

<210> 175

<211> 1697

<212> DNA

<213> Homo sapiens

<400> 175

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atcacgcccc tgtggatcat cactgctgca cactgtgttt atgacttgta cctccccaa 180
tcatggacca tccagggtgg tctagtttcc ctggttgaca atccagcccc atccccactg 240
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gaggatggag caggtgacgc ctccccctgc ctgaaccacg cgcccgctcc tttgatttcc 480
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gcgggctacc tgacgggtgg cgtggacagc tgcaggggg acagcggggg gcccctgggtg 600
tgtcaagaga ggaggctgtg gaagttagtg ggagcgacca gctttggcat cggctgcgca 660
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tgtggggagg ttaatctagg aatgactcgt ttaaggccta ttttcatgat ttctttgtag 1560
catttggtgc ttgacgtatt attgtccttt gattccaaat aatatgtttc cttccctcat 1620
aaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1680
aaaaaaaaa aaaaaaa 1697

<210> 176

<211> 1409

<212> DNA

<213> Homo sapiens

<400> 176

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cccgggctgc aggaattccg ctgctggcct ggggttgtgg ttgaggccgg gtctccgctc 180
ctgtgccccg gaagatgggt ctaggtggtt gcccggttag ttacttactt ctgtgcggcc 240
aggcggtttt gctgctgggg aatttacttc tgctgcattg tgtgtctcgg agccactcgc 300
aaaatgcgac cgctgagcct gagctcacat ccgctggcgc cgcccagccg gagggccccg 360

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cccaggaact tggttatggg tgtctcaagt tcggcggtca ggccctacagc gacgtggaac 540
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aaaaaaaaaa aaaaaaaaaa aaactcgag 1409

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<210> 177

<211> 1503

<212> DNA

<213> Homo sapiens

<400> 177

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tgttccacct gacagtgttt gtctttcata gactttccag aatagacata gtcaagatca 180
gacacgtgag cttctctctc attttaatgt gaggaatac atctttcaga gacaaggcac 240
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aagttacaga gtgtttccta gatagaagat tagttcattt ggttcatttt gtctttgaag 660
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aaa 1503

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<210> 178
<211> 1378
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (3)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (82)
<223> n equals a,t,g, or c

<400> 178
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actttattct tctggtgagc tccctgaata tttatttttc tgattataaa ttttctatat 180
tagtagcatt ttttaattat tactttctca ctatagagca tttactttta gtctctagat 240
gtatatatttg gaatgctrta cttggcataa catagattaa aatcataatg catgactaaa 300
aactccttgg atttatttcc catttttaaaa tttttagcgg taagttcaga tttataatct 360
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ctgcttatgc ttctccagtt ggccctccat gtccataggc ttcgcatctg tgattcagcc 480
cactgtgggt caaaaatatt tggggaaaaa aatggatggt tgcgcctttg ctgaacatgt 540
acaaactttt ttttgtcatt aaacaatata gtataacaac tatttacaaa gcatttacat 600
tgtattagct attataggta atctagagat gatttaaagt gtatggtagg atgtgcacag 660
gttatatgca aatactacac cattttctat aagggacttg aacatcatgg acttttagtat 720
cctaggggggt tcttggaacc catcacccat aggggcacca taggacaact atagtaccgt 780
gtttattttcc tattaattca gggtccggtt agagtctaaa actaaaacct aatcatttag 840
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gcacatactc aataaataaa tgactgcatt gttgtaaaaa aaaaaaaaaa aaaaaaaa 1378

<210> 179
<211> 2251
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (2020)
<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2050)

<223> n equals a,t,g, or c

<400> 179

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ctcccgccgc cccttcaccc cgacctggcc gcggagccgc gagcgtgaag ccgccgcctt 180
ccgggaaagt cttaatagac atcgatactt gaattcttta tttcccagtg aaaactccac 240
cgccttctat ggaataaatac agttttccta tttgtttcct gaagagttaa aagccattta 300
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caatgtgtct ttgccgttaa gatttgactg gagggacaag cagggtgtga cacaagtgcg 420
aaaccagcag atgtgtggag gatgctgggc cttcagcgtg gtgggggcag tggaaatctgc 480
ttatgcaata aaggggaagc ccctggaaga cctaagtgtc cagcagggtca ttgactgttc 540
gtataataat tatggctgca atggaggctc tactctcaat gctttgaact ggtaaaca 600
gatgcaagta aaactgggtga aagattcaga atatcctttt aaagcaca 660
ccattacttt tctgggtcac attctggatt ttcaatcaaa ggttattctg catatgactt 720
cagtgaacaa gaagatgaaa tggcaaaagc acttcttacc tttggccctt tggtagtcat 780
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<210> 180

<211> 1000

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (20)

<223> n equals a,t,g, or c.

<400> 180

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gggatctcac cgtgggtccg attagccttt tctctgcctt gcttgcttga gcttcagcgg 180
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tttcccgctc gcagagagcc ggcttgcaat tcccagtggt ccgtattcat cgacacctaa 300
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attctctcat caaggctaca attgctgggt gtggtgtcat tccacacatc cacaaatctc 540
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caggactcta aatactctaa cagctgtcca gtgttggtga ttccagtgga ctgtatctct 660
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ctttccaacc aaccaaattt ctgcattcga gtcttaacca tatttaagtg ttactgtggc 780
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aaaaaaaaaa aaaaaaaaaa maaaaaaggg gggggccccc 1000
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<210> 181

<211> 1429

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (761)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1407)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1420)

<223> n equals a,t,g, or c

<400> 181

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gccccgcacg ggctgtcttg gtgtccgcca tccagggctt ggcagagcct ctgagatgat 120
gcatgatgcc ctccccctcag cgcaggctgc agagcccggc cccacctccc tgcgcccttg 180
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cagggctgtt ggaggacccc gagggctgag gagcagcagg acccgcctgc tcccatcctc 480
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<210> 182

<211> 2725

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2713)

<223> n equals a,t,g, or c

<400> 182

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gactcagtgc agataatctc aggagacact gaagaaggga ggctctgtgg acagaggagc 480
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gttgccacag acataaatga atgcacagat tttgtagatg tcccttgtag ccacttctgc 660
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gtggagggac gtgttggtgc aacatcttcc tattcgactt gtcaaagcaa tggaaagtgg 1260
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gactaatcca gatacatccc accagcctct ccaagggtgg tgaccaatgc attaccttct 2340
gttccttatg atattctcat tatttcatca tgactgaaag aagacacgag cgaatgattt 2400
aaatagaact tgattgttga gacgccttgc tagaggtaga gtttgatcat agaattgtgc 2460
tggtcataca tttgtggtct gactccttgg ggtcctttcc ccggagtacc tattgtagat 2520
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tttcctcttt acctgttcaa aattccattt acttgatcat tctcagtatc cactgtctat 2640
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aaaaaaaaaa aanaaaaaaa aaaag                                     2725

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<210> 183

<211> 1751

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (344)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (416)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1617)

<223> n equals a,t,g, or c

<400> 183

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ggcatgttgt tgggactggc ggccatggag ctgaagggtgt ggtggatgg catccagcgt 120
gtggtctgtg ggggtctcaga gcagaccacc tgccagggaag tggatcatgc actagcccaa 180
gcaataggcc agactggccg ctttgtgctt gtgcagcggc ttcgggagaa ggagcggcag 240
ttgctgccac aagagtgtcc agtgggccc caggccacct gcggacagtt tgccagcgat 300

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gtccagtttg tcctgaggcg cacagggccc agcctagctg ggangccctc ctcagacagc 360
tgtccacccc cggaacgctg cctaattcgt gccagcctcc ctgtaaagcc acgggntgcg 420
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aaaaaaaaa a 1751

<210> 184

<211> 2200

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2096)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2140)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2157)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2181)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2184)

<223> n equals a,t,g, or c

<400> 184

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ggcacgagca gcgacatact gaagggcaac ttctcaatcc gtacagccaa gatgcagcag 60
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ccactactgc tccccgaaa cagacaaaata tatgagcaca acgaagctgc cctattcatg 180
gaccacagcg ggatgctggt gatgcttcct tttgacctgc ggatcccttt tgcaagatat 240
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cgcaagttag atcgatttca tcccaaagaa cttctggagt gtgcatttga tattgtcact 360
tctaccacca acagctttct gccactgct gaaattatct acactatcta tgaaatcatc 420
caagagtttc cagcacttca ggaaagaaat tacagtattt atttgaacca taccatgtta 480
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attctgtatg atgctgtgac agagaagctg acgaggagag aagtggaaagc taaattttgt 600
aatctgtctt tgtcttctaa tagtctgtgt cgactctaca agtttattga acagaaggga 660
gatttgcag atcttatgcc aacaataaat tcattaataa aacagaaaac aggtattgca 720
cagttggtga agtatggctt aaaagaccta gaggaggttg ttggactgtt gaagaaactc 780
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tactggaata atggaatggt gtacattcat cataatttaa aattaaattc taagaagagg 1920
ctgggtgcag tggctcacac ctttaatccc agcactttgg gaagccaagg caggaagact 1980
gcttgaaacc aggagtttga gaccagcctg agcaacaaag caagaccca tctctataaa 2040
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tgagatggat catctgagcc tcaggagggt gacgtgcan tgactgtgac tgcgccnctg 2160
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<210> 185

<211> 1987

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (523)

<223> n equals a,t,g, or c

<400> 185

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ggaaatatga ctttgattct tcggaggtgc ttcagggact ggactttttt ggaaacaaga 180
agtctgtccc aggtgtgtgt ggagcatcac aaacacatca gaagcccaa aatggagaga 240
aaaaagaaga gagcctaact gaaaggaaga gggagcagag caagaaaaaa aggaagacga 300
tgacttcaga aattgcttcc caagaagaag gtgtactat acagtggatg tcatctgtag 360
aagcaaaagat tgaagacaaa aaagttcaga gagaaagtaa actaacttcc ggaaagtgg 420
agaatctcag aaaagaaaag ataaacttct tgcggaataa acacaaaatt cacgtccaag 480
gaaccgatct tcctgacca attgctacat ttcagcaact tgnaccagga atataaaatc 540
aattctcgac tacttcagaa cattctagat gcaggtttcc aaatgcctac gccaatccaa 600
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gtagctcttg aagacaaaag ttaaaaacag actttaaaaa tactgtccca gaaatgtaat 1860
tttatgatcc cagcatgaat gttattttca tggataactt gaagtcttac agtcacctgt 1920
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caagtc
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<210> 186

<211> 1737

<212> DNA

<213> Homo sapiens

<400> 186

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ggatgatatg tgggcaaaat cacttatgaa agtagaagca agaatacagt ggtttgctac 180
cacataaagc catgctgttt ttggtcaaac tgtgtaaact ggaaaaatc acatcatttc 240
tgagtttaat cactttagga tatattcaca ttgttttggt gaatttgctg aattgaattg 300
tttttctttc tcaaatctgt gatctctttt ctttatcctg tttctttggt cctttcgttt 360
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gctttcttat ttttcttttg ttccattctt ttcttacttt tttccctttt ccttttttgg 420
ggaggctggc tagtagtggt tgagaaaaga atagaagtga aatttgcata atgaatgtaa 480
aagggaaata aaagtctttt gaaggtagct atactagcac ttttgatcat cttcagggcc 540
cacaaaaatg ttgtcaagat tttaaagggt tataattctg cttaaagctct agtttgact 600
taggtatcct aactatgttg gaggtatttg cattgtttta agttaggata aaagcaagtt 660
cctcctgtga ctgcaacgtc ttactgattg ggacagttgc caggaggata ccaacttgat 720
agcagagggg gttttatgca aacgcactca cctccgcctt ggggaatgaa agggtcactt 780
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gtatatattt cttgccataa tggtaaagga ctgattgata tatttaagag ttaataaatt 1680
tgtgatttct gctgaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaa 1737
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<210> 187

<211> 1132

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1131)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1132)

<223> n equals a,t,g, or c

<400> 187

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agatcctgga gtcccagagg cccctgcag gcatccctgt agcccatcc agtggctgag 180
gaggctccag gcctgaggac caagggatgg cccgactcgg cggtttgogg aggatgcagg 240
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atcagacaac tccctgcatg caaaccccta gtacctctc acaccgcac ccgcgcctca 360
cgatccctca ccagagcac acggccgcgg agatgacgtc acgcaagcaa cggcgctgac 420
gtcacatatc accgtggtga tggcgtcacg tggccatgta gacgtcacga agagatatag 480
cgatggcgtc gtgcagatgc agcacgtcgc acacagacat ggggaacttg gcatgacgtc 540
acaccgagat gcagcaacga cgtcacgggc catgtcgacg tcacacatat taatgtcaca 600
cagacgcggc gatggcatca cacagacggg gatgatgtca cacacagaca cagtgacaac 660
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ggccaaggta cccacaggat cccatccccct cccgcacagc cctgggcccc agcacctccc 840
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gagaacagga agccattcac ctccgctcct tgagcgtgag tgtttccagg accccctcgg 960
ggccctgagc cgggggtgag ggtcacctgt tgtcgggagg ggagccactc cttctcccc 1020
aactcccagc cctgcctgtg gcccgttgaa atgttggtgg cacttaataa atattagtaa 1080
atccttaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa nn 1132
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<210> 188

<211> 1267

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (12)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (25)

<223> n equals a,t,g, or c

<400> 188

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ccggtccgga attcccgggt tgatccacgc gtccgcccac gcgtccgccc acgcgtccgc 120
tggaaggcag ctatgcgact caccgtgctg tgtgctgtgt gcctgctgcc tggcagcctg 180
gccctgccgc tgcctcagga ggcgaggagg atgagtgagc tacagtggga acaggctcag 240
gactatctca agagatttta tctctatgac tcagaaacaa aaaatgccaa cagtttagaa 300
gccaaactca aggagatgca aaaattcttt ggccctaccta taactggaat gttaaactcc 360
cgcgctcatag aaataatgca gaagcccaga tgtggagtagc cagatgttgc agaatactca 420
ctatttccaa atagcccaaa atggacttcc aaagtggtagc cctacaggat cgtatcatat 480
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ggcaaagaga tccccctgca tttcaggaaa gttgtatggg gaactgctga catcatgatt 600
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gctcatgcct ttgcgcttg gacaggcttc ggaggagatg ctacttcga tgaggatgaa 720
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ctccttttaa ggataaactc ctttatgggtg tgactgtgtc ttattcatct atacttgtag 1140
tggttagatg tcaataaatg ttacatacac aaataaataa aatgtttatt ccatggtaaa 1200
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1260
aaaaata 1267
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<210> 189

<211> 3787

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (22)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (155)

<223> n equals a,t,g, or c

<400> 189

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ggtcggcctg gaagcagcca agacggaaaa gcaantgtgt gagcccgaaa acccatgcaa 180
ggacaagaca cacaactgcc acaagcacgc ggagtgcata tacctgggtc acttcagcga 240
ccccatgtac aagtgcgagt gccagasagg ctacgcgggc gacggggtca tctgcgggga 300
ggactcggac ctggacggct ggcccaacct caatctggtc tgcgccacca acgccacct 360
ccactgcata aaggataact gcccccatct gccaaattct gggcaggaag actttgacaa 420
ggacgggatt ggcgatgcct gtgatgatga cgatgacaat gacggtgtga ccgatgagaa 480
ggacaactgc cagctcctct tcaatccccg ccaggctgac tatgacaagg atgaggttgg 540
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tggagagggg gacgcctgct ccgtggacat tgatggggac gatgtcttca atgaacgaga 660
caattgtccc tacgtctaca aactgacca gagggacacg gatggtgacg gtgtggggga 720
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catcagttag acagacttca ggaacttcca gatggtcccc ttggatccca aaggggaccac 1140
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<210> 190

<211> 554

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (520)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (542)

<223> n equals a,t,g, or c

<400> 190

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<210> 191

<211> 874

<212> DNA

<213> Homo sapiens

<400> 191

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<210> 192

<211> 2103

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (140)

<223> n equals a,t,g, or c

<400> 192

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<210> 193

<211> 1317

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1314)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1315)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1316)

<223> n equals a,t,g, or c

<400> 193

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ctccagacct catgccttct gggacccaga catctctgca atctcgggaa ctggaataca 180
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<210> 194

<211> 1252

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1231)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1240)

<223> n equals a,t,g, or c

<400> 194

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<210> 195

<211> 1688

<212> DNA

<213> Homo sapiens

<400> 195

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cagctggatg caccatccc caatgcaccc cctgcgcgct ggcagcaaaa gccaaggaag 180
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<210> 196

<211> 756

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (756)

<223> n equals a,t,g, or c

<400> 196

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acagctggga caaggatgtg taccctgagc ccccgcgccg cacgcccgtg cagcccaatc 180
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<210> 197

<211> 1471

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (458)

<223> n equals a,t,g, or c

<400> 197

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acaccctgt actcagcaga tccaaacgcc atcgatacgg actattaccc tggagggtac 180
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<210> 198

<211> 692

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (43)

<223> n equals a,t,g, or c

<400> 198

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<210> 199

<211> 1573

<212> DNA

<213> Homo sapiens

<400> 199

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<210> 200

<211> 2742

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (26)

<223> n equals a,t,g, or c

<400> 200

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<210> 201

<211> 1417

<212> DNA

<213> Homo sapiens

<400> 201

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<210> 202

<211> 1512

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (855)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1512)

<223> n equals a,t,g, or c

<400> 202

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aaaaaaaaaa an 1512
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<210> 203

<211> 419

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (384)

<223> n equals a,t,g, or c

<400> 203

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tgggcagggg cccgctggcc tgggtgcttg cgctgtgcgg ctggggcgtg catggcccc 240
aggggcacgc argctgaaga aagtccttcc gtgggcaacc cagggaatat cacaggtgcc 300
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cggggactca cgggcaccct tcggtgtcag ctccagggtc agggagagcc ccccgaggta 360
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<210> 204

<211> 2833

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2802)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2822)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2831)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2832)

<223> n equals a,t,g, or c

<400> 204

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<210> 205

<211> 5830

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (5585)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (5821)

<223> n equals a,t,g, or c

<400> 205

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<210> 206

<211> 755

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (368)

<223> n equals a,t,g, or c

<400> 206

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<210> 207

<211> 1996

<212> DNA

<213> Homo sapiens

<400> 207

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<210> 208

<211> 1668

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1505)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1565)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1598)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1620)

<223> n equals a,t,g, or c

<400> 208

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<210> 209

<211> 2250

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (23)

<223> n equals a,t,g, or c

<400> 209

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<210> 210

<211> 838

<212> DNA

<213> Homo sapiens

<400> 210

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taaaagggaa atgagtttga actgaaaaaa aaaaaaaaaa aaactcatat agactgaagc 780
gcggtgatta aataatgaaa gagttcgacg cggccgggaa tttaggagggt aaatatcc 838
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<210> 211

<211> 1213

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1206)

<223> n equals a,t,g, or c

<400> 211

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gaaccggttt cgggcctcag agcgtctggt gagatgctgt tgccgctgct gctgtgcta 180
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tgtcctaatt gcagcttcca ctgcaccaac actggctata agcccctgta tatccctcc 420
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<210> 212

<211> 969

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (922)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (955)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (958)

<223> n equals a,t,g, or c

<400> 212

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<210> 213

<211> 1694

<212> DNA

<213> Homo sapiens

<400> 213

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aaaaaaaaaa aaaa 1694

<210> 214

<211> 1210

<212> DNA

<213> Homo sapiens

<400> 214

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<210> 215

<211> 1776

<212> DNA

<213> Homo sapiens

<400> 215

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1776

<210> 216

<211> 1418

<212> DNA

<213> Homo sapiens

<400> 216

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<210> 217

<211> 2200

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2188)

<223> n equals a,t,g, or c

<400> 217

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tgccctggga cgcaaggccc tggacattgc tgagaacgag atgccgggcc tgatgcgtat 180
gcgggagcgg tactcgccct ccaagccact gaaggcgcc cgcacgctg gctgcctgca 240
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<210> 218

<211> 1853

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (890)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1794)

<223> n equals a,t,g, or c

<400> 218

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tggtgggcgc cgtgaagagc cttcaggcgc tgggcgaggt catcgaggct gaacttcggt 180
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gcccccaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 1853

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<210> 219

<211> 1093

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1090)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1091)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1092)

<223> n equals a,t,g, or c

<400> 219

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<210> 220

<211> 2155

<212> DNA

<213> Homo sapiens

<400> 220

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gccctgagta ggggtgtgacc tccgcagccg cagaggagga gcgcascagg cctcgaagaa 180
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<222> (7)

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<210> 222

<211> 2085

<212> DNA

<213> Homo sapiens

<400> 222

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<210> 223

<211> 2921

<212> DNA

<213> Homo sapiens

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<222> (2920)

<223> n equals a,t,g, or c

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<221> misc feature

<222> (2921)

<223> n equals a,t,g, or c

<400> 223

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<211> 4395

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (325)

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<220>

<221> misc feature

<222> (4382)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (4391)

<223> n equals a,t,g, or c

<400> 224

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<213> Homo sapiens

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<222> (2959)

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<210> 226
 <211> 1511
 <212> DNA
 <213> Homo sapiens

<400> 226

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<210> 227

<211> 2239

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2238)

<223> n equals a,t,g, or c

<400> 227

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cccagtcagc acctaccctt tcccccccag gggkttgaat atgcaaaagc agttccgctg 600
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gggtcccaat cccccctnt

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<210> 228

<211> 2346

<212> DNA

<213> Homo sapiens

<400> 228

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tccaacacct acaacaggca gaactgggag gatgcggaact tccccattct gtccagaca 180
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aaaaaa 2346

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<210> 229

<211> 2246

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2235)

<223> n equals a,t,g, or c

<400> 229

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<210> 230

<211> 2002

<212> DNA

<213> Homo sapiens

<400> 230

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```

<210> 231

<211> 994

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (394)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (853)

<223> n equals a,t,g, or c

<400> 231

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tttgagcaag ctgttgcaag aggatttttt aactatattg aaaaactgaa gtatgaacac 720
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acgtaagtgg aantcatatg aaatactttg gtaataggtt ataaattaaa tttctatggt 900
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<210> 232

<211> 486

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature
 <222> (49)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (440)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (485)
 <223> n equals a,t,g, or c

<400> 232
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 ctgccaaagat gtccctgccag cagaaccagc agcagtgcca acccccaccc aagtgtccct 180
 cacccaagtgc tccccaaaag agcccagtag agtgctctgcc tccagcttcc tctggctgtg 240
 ccccaagctc tgggggctgt ggcctagctc cgagggcggc tgcttcctga accaccacag 300
 gcgccaccac cgatgccggc gccagaggyg caactcctgt gacagggcag tggtcagcaa 360
 ggcgrgggyt ctggstgckg caygggtctg ggggctgctg ctgatccaga tcctgatgct 420
 gagacaagcg atctttggan gaaacaagaa ttcccaagag gccaagaaca gcccacatctg 480
 gaagnc 486

<210> 233
 <211> 2081
 <212> DNA
 <213> Homo sapiens

<400> 233
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 taagtctttt ggaggacgaa caactggagg ttcgagaaat ggctgctact accttaagcg 180
 gtctgctaca gtgtaacttt cttaccatgg acagtcctat gcagattcat tttgagcaac 240
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 ttcttctgc agagttggtc aaacgccatg ctgggggtgct aggacttggc gcatgtgttc 360
 tttctagtcc ttacgatgtt cccacctgga tgccccagct cctcatgaat ctcatgtcac 420
 atctaaatga tcctcagcct attgagatga ctgtaaaaaa aaccttatcc aatttccgaa 480
 gactcaccat gacaactggc aggaacataa acagcaattc actgatgacc aactgcttgt 540
 tctcaccgat cttcttgtgt caccatgcta ttatgcatag aaagatgact agtcctcact 600
 tcaggctctt tcatcaaaa attccacacc ctcaggtacc atctgtgggt gctctctgca 660
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gttgctaaaa aattgggggt ttggtgaaga aatctgattg ttgtgtgtat tcaatgtgtg 1260
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ctttacaaat attttttgac cctctgaaaa ttattatact tcacctaaat ggaagactgc 1380
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```

<210> 234

<211> 516

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (490)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (498)

<223> n equals a,t,g, or c

<400> 234

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cggcacgagg ggccagggtg cgggcctgcg cctccctcgg ctccctggcg gggcctcggg 60
gagaggggtg gaagatgtct atggatgtga cattcctggg gacgggtgca gcatacccat 120
ctccaacccg ggggtgcctct gctgtggtcc ttcgggtgga aggcgagtsc tggctctttg 180
actgtgggga gggaacacag acacagctta tgaaaagcca acttaaagca gggagaatta 240
ccaagatctt catcacacac cttcatggag accatttctt tggccttcct gggctcctct 300
gcacaatcag cctgcagagt ggctccatgg tgtccaaaca gcctattgaa atctatggcc 360
ctgtaggctt cgggacttta tctggcgaac catggaactc tctcamacgg gagctggtct 420
tccattatgt ggttcatgaa ctggttccta cagcagatca atgtcctgca gaaggaacta 480
aaagaatttn cgcattgtnaa tagagcagac agtctct 516

```

<210> 235

<211> 1129

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (807)

<223> n equals a,t,g, or c

<400> 235

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cagctcgwcc tctgcttccct tacagcacc cccacctgcc gagctgatcc tccctaggcc 60
ctgcctaacc ttgagttggc ccccaatccc tctggctgca gaagtcccct taccccaat 120
gagaggagg gaggaccag atcttttgag agctgagggt tgagggcatt gagccaacac 180
acagatttgt cgctctgtc cccgaagaca cctgcaccct ccatgcggas caagatgggg 240
aatggaactg aggaagatta taactttgtc ttcaagggtg tgctgatcgg cgaatcagg 300
gtggggaaga ccaatctact ctcccgatc acgcgcaatg agttcagcca cgacagccgc 360
accaccatcg gggttgagtt ctccaccgc actgtgatgt tgggcaccgc tgctgtcaag 420
gctcagatct gggacacagc tggcctggag cgggtaccgag ccatcacctc ggcgtactat 480
cgtggtgcag tggggggccct cctggtgttt gacctaacca agcaccagac ctatgctgtg 540
gtggagcgat ggctgaagga gctctatgac catgctgaag ccacgatcgt cgtcatgctc 600
gtgggtaaca aaagtgacct cagccaggcc cgggaagtgc ccaactgagga ggcccgaatg 660
ttcgtgaaa acaatggact gctcttccct gagacctcag ccctggactc taccaatgtt 720
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aacagcatcc ggaccaatgc catcacntct ggcagtgcc aggctggaca ggagcctggc 840
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ttccagatat cagactgttc cctgttcaca gcacctcag ggtcttaagg tcttcatgcc 1020
ctatcacaaa tacctctttt atctgtccac ccctcacaga ctaggaccct caaataaagc 1080
tgttttatat caaaaaaaaa aaaaaaaaa aaaaaaaaa aaaaaaaaa 1129

```

<210> 236

<211> 1045

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (973)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1001)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1014)

<223> n equals a,t,g, or c

<400> 236

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atcctcaaag gcagctcagg ctccgtgtgg ctgcgcaacc tgcaactggg cctcttcggc 60
acagcactgg gcctggtggg gctctggtgg gctgagggta ccgcctggc caccctggt 120
ttcttttttg ggtacacacc tgctgtctgg ggcgtggtgc tcaaccaggc cttcggcggg 180
ctactggtgg ctgtggttgt caagtacgct gacaatatcc tcaagggtt tgccacctcc 240
ctgtccattg tgctgtccac tgttgccctc attcgctctt ttggcttcca cgtggaccca 300
ttatttgccc ttggcgctgg actcgtcatt ggtgctgtct acctctacag ccttccccga 360
ggtgcagyca aagccatagc ctctgcctct gcctccgctt ccgggcccctg cgttcaccag 420
cagcctcccc ggcagccacc accaccgcag ctgtcttccc accgtggaga cctcatcacg 480

```

```

gagccctttc tgccaaagtc agtgctggtg aagtragggc tggcagcaat ggggggacac 540
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cggggccttg ctcctctggg tttgggagat ggtcttttct ccaggtcac tgagacttct 660
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tcccctggag ggggtgtttag agctgccgcc tctgctccct ctaacctctt tggaggcagg 780
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tggaacaaac tccgagtctt aggaatgacg atgcctactg tggggtagtg ccatagtttg 960
gcttttctcc ttncacgttg atatgtatag tcgctttggg nctgccagtt cttntacttg 1020
aatgcttctg gagccaggaa aggca 1045

```

<210> 237

<211> 690

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (666)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (678)

<223> n equals a,t,g, or c

<400> 237

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ggaggagggg ctgccacagc tctccgcacc tctcctctcc cagggcagcc tgtgagcagc 60
aagctgtggc tctgactctg caggaggaca gagcatccct gacgctttca ggggggccct 120
cggcactggc ctttgacctc tccaaggtac caggcccaga ggcagcccc aggctgyggg 180
cgctgacact gggcctggca aaacgcgtgt ggagcctgga gcggcgactg gcagctgcag 240
aagagacagc tgtcagcccc aggaagagcc cccggcctgc agggcctcag ctcttcttac 300
cagaccaga tccccagaga ggtggccctg gacctggagt caggaggcgg tgtccaggag 360
agtcgctcat caaccccggg ttcaagagta agaaaccagc tgggtggcgtg gacttcgatg 420
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aggactaaca cggctcctca aattccttcc ctgtcaaata aacagctccc ttggttgaa 600
aaaaaaaaa aaaaaaaaaa agtttttttt aattttaagg cgggccaaag tttttttcc 660
tttttngttg aagggttnat tttttagttt 690

```

<210> 238

<211> 1873

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (568)

<223> n equals a,t,g, or c

<400> 238

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ccccgggctca gtatgtggcg ccttcctcgc gcgctgtgtg tgcacgctgc aaagaccagc 60
aagctctctg gaccttggag caggcctgcc gccttcatgt ccactctcct catcaatcag 120
ccccagtatg cgtggctgaa agagctgggg ctccgcgagg aaaacgaggg cgtgtataat 180
ggaagctggg gaggccgggg agaggttatt acgacctatt gccctgctaa caacgagcca 240
atagcaagag tccgacaggc cagtgtggca gactatgaag aaactgtaaa gaaagcaaga 300
gaagcatgga aaatctgggc agatattcct gctccaaaac gaggagaaat agtaagacag 360
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ggaaaggagc tccaaccact tccctcatta gtgtggctgt cacaaagata atagccaagg 720
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cagtgaactaa tccccctatg accccaaagc cctgattaaa tcaagagatt ccttttttaa 1800
aaatcaaaat aaaattgtta caacatagcc atagttacta aaagatgagt taggtggatt 1860
tttattatgg tca 1873

```

<210> 239

<211> 905

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (873)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (874)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (897)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (898)

<223> n equals a,t,g, or c

<400> 239

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gaccacgcg ggcgcggcgc tgcagaacta caacaacgag ctggtcaagt gcatagagga 120
gctgtgccag aagcgggagg agctgtgccg gcagatccag gaggaggagg acgagaagca 180
gcggctgcag aatgaggtga ggcagctgac agagaagctg gcccgcgtca acgagaacct 240
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ggggg                                           905
```

<210> 240

<211> 1484

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1457)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1471)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1480)

<223> n equals a,t,g, or c

<400> 240

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agatatacaa atatacagat atacaaataa ggggtgaagat ggagggaatc tgataaagac 180
atcttataaa ttcaacagac acaaaagaat ttgatctccc ataagcaact gtgaaattac 240
aataacagat cctgggaagt tctacaattc taattcagtt ttttcaaggg ggaacatggc 300
```

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aaaggtgttc agtttcatcc ttgttaccac cgctctgaya atgggcaggg aaatttcggc 360
gctcgaggac tgtgcccagg agcagatgcg gctcagagcc caggtgcgcc tgcttgagac 420
ccgggtcaaa cagcaacagg tcaagatcaa gcagcttttg caggagaatg aagtccagtt 480
ccttgataaa ggagatgaga atactgtcgt tgatcttgga agcaagaggc agtatgcaga 540
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aattcagaga cgatctgatg gcagtgaaaa ctttaacaga ggatggaaa actatgaaaa 720
tggctttgga aattttgtcc aaaaacatgg tgaatattgg ctgggcaata aaaatcttca 780
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tgctttcagt acagcagata tgcaatatcc accaaataaa tgtagactgt gttaawaaaa 1440
aaacaacaaa tatgaanaaa aaaaaaaaaa nggggggctn tttt 1484

```

<210> 241

<211> 1521

<212> DNA

<213> Homo sapiens

<400> 241

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caaaagcctt aatgggcctg cagactttga aaagcgagtg gagggcggtg ggcggccgcg 60
tgcgccccctg gtcaatgccc tcctgacagc acccgagttc cttattttaca ctggctgcat 120
ggtttgtgtg tttctgtttt gttctctccc ccctgcaggg ctgtttkcg ggtggggttg 180
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catgagcaaa aactccaaac tcctctccac cagcgccaag agaattcaga aggagctggc 360
ggacatcact ttagaccctc cacctaattg cagtgtgtgt cccaaaggcg ataacatcta 420
tgaatggaga tcaaccattc tagggcctcc aggatccgtg tatgagggtg gtgtattctt 480
tctcgatata actttttacac cagaatatcc cttcaagcct ccaaaggtta catttcggac 540
aagaatctat cattgtaata ttaacagtca aggtgttatt tgcttggaac tattgaaaga 600
taattggagt ccagactaa ccatttctaa agtcctcctt tctatctgct cacttcttac 660
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agcagaacat gacagaatgg ccagacagtg gaccaagaga tacgctacat aaattggggt 780
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tggaatagga gttgctcagt ggattgggtc tatgttgttg actacttaag tctgcatttg 1440

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tttcttttgc cttttggttg c 1521

<210> 242

<211> 1144

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1093)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1105)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1106)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1139)

<223> n equals a,t,g, or c

<400> 242

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tcccagagga gcaggaatta gaagcttatg tagatgatag agatattgat agtgatttca 180
gaaaggatga tttttattac ttgtctcaag aagacaaaaga gagacagaag cgtgagcatg 240
aagaatccaa gaggttgctc caagaattaa aatctgtgct gggattttaa gcttcagagg 300
cagaaaggca gaagtggag caacttctat ttagtgatca tgtgtttctt catatagctt 360
taaaattatg ctattgacat tatgggaaag atttatcaat gagagaaatg tgtctctttt 420
tcagccgtgt tgaaatcctt gtctcctgta gaccagtg gacccataag taattcagaa 480
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cccg 1144

<210> 243

<211> 934

<212> DNA

<213> Homo sapiens

<400> 243

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cccgaacacc atcatgtgga gacatttgca attttcctcc taaaattgcc catgggcatt 180
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aaattgaaca actggaacta cagagagaca gcgcaagaca atccactttg gataaagaac 660
tataatTTTT ctcaaaagaa ggaggaaaag gtgtcttgct ggcttgctc ttgcaattca 720
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tctagaaatg ataatttgct aaagttagt gctttgagat tgtgaaatta ttaatcatcc 840
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aatgtatgta taaaaaaaaa aaaaaaaaaa tcga 934
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<210> 244

<211> 915

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (210)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (243)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (244)

<223> n equals a,t,g, or c

<400> 244

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aacaaggacg agatgtccac gaagggtggn gagccacctg atcgagaagc tgccrggcas 240
gtnnngggtga gaagtygccc ccagccgagg tgcgtggtcaa catcatagct gtgctcaaca 300
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aggctatcgg aaggaggact tcctgggccc ataggtgaag ccttctggag gagaaggtga 540
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gagaaggcta atgacggagg ggcccctcgc tggggcccct gtgtgcatct ttgaggggtcc 660
tggggcacca ggagggggcag ggtcttatag ctggggactt ggcttccgca gggcaggggg 720
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aaaaaaaaa aaaac
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<210> 245

<211> 1276

<212> DNA

<213> Homo sapiens

<400> 245

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tgcattgtgtt agaatttaat ccctttgaga atggggattc aggaaaccta attgcatatg 240
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aaggcattca gtataaaaaca cttcgaacat ttcaccatgg agtcagggtt gatggcatag 360
cttgaggccc agagactaga cttgattcat tgcctccagt aatcaaattt tgtacttcag 420
ctgctgatat gaaaattaga ttatttactt cagatcttca ggataaaaaat gaatataagg 480
tttttagagg ccataccgat ttcattaatg gtttggtgtt tgatcccaaa gaaggccaag 540
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cagctcattt tgttcttcat tctcctggca tgagtgtgtg ctggcatcct gaggagactt 660
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<210> 246

<211> 3366

<212> DNA

<213> Homo sapiens

<400> 246

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ctggtgcccc ttgtgcctga ccttcaagat gtggctcagt tgcgttcccc tctgcccagg 180
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ttctgcagtc gtgtcattga tgaagaactc aaccacaggt ggggagagac ttatgaggtg 360
atggtacacg aggtcccagg gcaggagatt gaagtggagg tgttcgacaa ggatccagat 420

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```

aaagatgact ttctgggcag aatgaagctg gatgtagga aggtgttaca ggctagcgtt 480
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<210> 247
<211> 2148
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1259)
<223> n equals a,t,g, or c

<400> 247
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<210> 248
<211> 2225
<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (14)

<223> n equals a,t,g, or c

<400> 248

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cattcaatag tgtgctgtca aagtgtgctt agctcacctg gatataccta cattgttaaa 2160
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aaaaa
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2225

<210> 249

<211> 1204

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1197)

<223> n equals a,t,g, or c

<400> 249

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gaaccaggag gtttgggggt aagagatact caaaaatttt cacaagccaa gtagggcata 780
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ctcttataga catgccaat gctggcaaaa agaagtgctt tttggatatg gcagcacttg 1080
taaaaaataa gcagtaagca aaatcctttt aaacacagaa atcctgagtt cttctcattg 1140
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aaaa 1204
```

<210> 250

<211> 1314

<212> DNA

<213> Homo sapiens

<400> 250

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ccttcgcttg ctgagagtca ttggaaaaac cactgaactg gctacttttt aattactatt 180
tgacaacctg ccttcagtct tcagttaata agcaccgaca tatgtttgta aaacaagttg 240
atatggatca tgtcatgaag gctaaatcca tcagagagtt tgataagcga ttcacttcag 300
tcatgttttg ataccaaaca attgatgatt attatactga tgccagtccg agtcctagac 360
tgaagtcagt aggaattcca gtattgtgtc taaattctgt ggatgatgtt ttctcaccac 420
gtcatgctat tccaatagaa actgctaagc aaaatcctaa tgttgctttg gtccttactt 480
cttatggagg ccatattggg tttctggagg gaatctggcc aagacagtcc acttacatgg 540
atcgtgtctt caagcaattt gtgcaagcca tgggtgagca tggacatgaa ctctcttaac 600
atgtagttct ttgggtgcat tttgtctgaa ccacaattgt gaaggcagct cagcttagtg 660
cacaaatttt aactgttgta tataaagcaa ataagccagc agatgggtga agagggtccag 720
aatgatatgc aaaaactact ttttagagaa acaaaacaac tttgtagcaa caaattaaat 780
atagtattag attgttactt acgtagattt ttttttact atgccttacc aagtacatcc 840
ttaaacaag tagtatgtac atgaaattgc acttaaccaa aactattgtg taaaacaaat 900
ttaattcct cagggtttta atttaaacta gtattttttt agattatttg ttttaggtga 960
```

```

tttaatggta ctttaataac tactaagaaa tattggctat ttcaatgtaa gttataaggt 1020
ggtacattcc taagggtatt tatagttgat gataacatga aaactgaaat aagataaaat 1080
acaacgtgct aaatctttta tgtattctaa ctttaaaaga caagtgaac aaagttagac 1140
tgacttctat atgtgctctt ttactctgat aatattaaat taggactaac ttatgtttta 1200
taatgattat aatttacatg cttattttta aaatagtata tgtggacaca tatatatcat 1260
tatattaaaa taaattctac catttttaaat tggaaaaaaa aaaaaaaaaa aaaa      1314

```

<210> 251

<211> 1159

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1132)

<223> n equals a,t,g, or c

<400> 251

```

cctgcctcag cctcctcagt agctgggact acaagtgcct gccaccacgc ctgggttatt 60
ttttatattt ttagtagaga cgggggtttca ctgtgttagc caggatggtc tcgatctcca 120
ggatggcttc gatctccagg atgggtctcga tctcctgacg tcgtgatcca ccgcctcgg 180
cctcccaaaa tgctgggatt acaggtgtga gccactgtgc ccggccaaaa gaacagaaat 240
tattttatcc tgaagtaagc tgtttatatt tgggattata ctgaacctat ttgtccaata 300
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ttcagattag ctgaaaggaa aaaaagtaga agcctgacta cttggtgcta actactaaag 420
attttggcag aatcaatgtt ggatttggtt ttccctgtccc ttccccatgc cagcccccca 480
gagtgttctg ccttgtgctg cctcccttca cckggagtgc cacaccctc tctctgccag 540
ttcagctctt cattcttcaa ggcctgacct tgtctgacct ttgtgcctct aaaccctggt 600
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cagaaaatat cttgcacaaa attacctctg ttaaggaatc tgaagctgaa tttagtttg 780
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gaagtggggg ttgaggagag ccagatggct ggagtgggta tttgaaggkc tttctgtcac 1080
ctgttcagtg tggctgtccc caccctgct gacmaagact gactgaaatg tnaaataata 1140
cagaccatct caactcaga                                     1159

```

<210> 252

<211> 2488

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (7)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (64)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2334)

<223> n equals a,t,g, or c

<400> 252

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tgtatgncca gctgggtactc ctgcaggtac cgggtccggat tcccgggtcg acccacgcgt 60
ccngngacgc gtgggttgct cggcagcttg caaagcctga caacaccttg tttgtaaaca 120
gaacactttt tgatcaggtc cttgaattcc tttgtagtcc tgacgatgac tcccgacact 180
ctgaaagaca gcaggtcctt ttagaattgc tgcaggctgg aggcatagtt caatttgaag 240
agagtcgact catccggatg gcagaaaaag ctgagttcta tcaaatttgt gaatttatgt 300
atgaaagaga acaccaatat gacaaaatta ttgattgcyt cttacgtgac cctctgcgag 360
aggaagaagt ctttaattac attcacaata tcttayccat tcccggacac agtgacagagg 420
agaagcagtc tgtatggcag aaagcaatgg atcatattga ggaacycgkg kccctgaagc 480
cttgtaaagc tgcggagctg gttgccaccc acttttcttg acatattgaa acggtcatta 540
aaaaacttca gaaccagggt ttgcttttca aatttttgag gagtcttctt gacccaaggg 600
aaggatttca tgtaaatcaa gaattactgc aaatatctcc ttgtatcaca gagcagttca 660
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gctaccgtct ggaagaaact attcagatta ctcagaagta tcaacttcat gaagtcaccg 780
cttatctatt ggaaaagaaa ggagatattc atggtgcctt cctaataatg ttagagagac 840
tacaaagcaa acttcaagag gtaacacatc aaggtgaaaa taccaaagag gatccctcat 900
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atttgaacca gcagcaactg gaggcccttt gggttccgtt attggaggca atgatggccc 1020
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cacatacctc tgtccagctt tttaggaaat acatttcgcc tattgcgact ttttccattt 2160
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gggccaatct cctttaatgt gttcatgtta aaacctatct gagtgtgaaga cttgcccttt 2400
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```

<210> 253
<211> 1554
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (6)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (81)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1496)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1523)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1535)
<223> n equals a,t,g, or c

<400> 253
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cgggtcgacc cagcgctccg nggacgcgtg gggtctggtt ttgctctagt gtttggggtt 120
cttcgcggct gctcaagatg aaccgactct tcgggaaagc gaaacccaag gctccgccgc 180
ccagcctgac tgactgcatt ggcacggtgg acagtagagc agaatccatt gacaagaaga 240
tttctcgatt ggatgctgag ctagtgaagt ataaggatca gatcaagaag atgagagagg 300
gtcctgcaaa gaatatggc aagcagaaag ccttgcgagt tttaaagcaa aagaggatgt 360
atgagcagca gcgggacaat cttgcccaac agtcattcaa catggaacaa gccaattata 420
ccatccagtc tttgaaggac accaagacca cggttgatgc tatgaaactg ggagtaaagg 480
aaatgaagaa ggcatacaag caagtgaaga tcgaccagat tgaggattta caagaccagc 540
tagaggatat gatggaagat gcaaatgaaa tccaagaagc actgagtcgc agttatggca 600
ccccagaact ggatgaagat gatttagaag cagagttgga tgcactaggt gatgagcttc 660
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agatccctgc ttcataagatt tgcattcttc aagcatatct tgtaaaacaa acacatatta 840
tgggactagg aaatatattat ctttccaaat ttgccataac agatttaggt ttctttcctt 900
tctttgaagg aaagttaaat tacattgctc ttttatTTTT tccattaaga gactcattgc 960
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cagtttaaaa gtatttttag ctcgtatgac ttgttttcat tcattaataa taatttgaaa 1080
taaaactaag gaaatggaat cttaaaagtc tatgacagtg taactctaca gtctcaaaat 1140

```

gacctgataa attgataaga caaagatgag attattgggg ctgttcatat tatgattcag 1200
aatcattttc tattgtggtg ttatagggtg gttaaagtga tggccttttt gatggggttt 1260
gttggtgtctt gtgaacaagt cgttactgtg tccattattg gaatggaatt atcactactg 1320
tatcatgagt ggggtattttg attctatggt tccctcagta ttacatcttg acttgtaatc 1380
aattatgaat atttcttgat atttaatgta taggacattt atttatactc aataaatatt 1440
tttcaaaagg aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaggggcg cccgcncatg 1500
aggatcccc gaggggggccc cangcttacg cgtgncatgc gacgtccaaa gccc 1554

```

<210> 254

<211> 1506

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (43)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1492)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1501)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1506)

<223> n equals a,t,g, or c

<400> 254

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ctttgtagct gagaacggct tgtttattgc tacaaagact ctattgacat tggtagcttc 180
agcggcagca gcttcttacg gtataaagct gttgcttcct gaagaggcta caagcatcct 240
tccctaggac tgctgtaagc tttgagcctc tagcaggaga catgcctcgg ggacgaaaga 300
gtcggcgccg ccgtaatgcg agagccgcag aagagaaccg caacaatcgc aaaatccagg 360
cctcagaggc ctccgagacc cctatggccg cctctgtggt agcgagcacc cccgaagacg 420
acctgagcgg ccccgaggaa gacccgagca ctccagagga ggcctctacc acccctgaag 480
aagcctcgag cactgcccac gcacaaaagc cttcagtgcc ccggagcaat tttcagggca 540
ccaagaaaag tctcctgatg tctatattag cgctcatctt catcatgggc aacagcgcca 600
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gcatctttgg agatccgaag aagatcgtca cagaagagtt tgtgcgcaga gggtagctga 720
tttataaacc ggtgccccgt agcagtcggg tggagtatga gttcttctgg gggccccgag 780
cacacgtgga atcgagcaaa ctgaaagtca tgcattttgt ggcaagggtt cgtaaccgat 840
gctctaaaaga ctggccttgt aattatgact gggattcggg cgatgatgca gaggttgagg 900
ctatcctcaa ttcagggtgt aggggttatt ccgcccctta agtagatctg aggcagaccc 960
ttgggggtgt aaaagagagt cacaggtacc ccaaggagta gatgccaggg tcctaagttg 1020

```



```

aaaatgatgt cgattggggg cgggggacac tgtatttgat atttgtgatc agtgatcatt 1080
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tccgtttgtt gagaataaca atatgtttta aaatataatt gaacaaattt ttttctttgt 1200
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acccagtaaa atgttgaaga aggatggagg atttcttcat atctgacgtt tctgaaaccc 1380
tttgtgtctg ctgttgtgtg aagattgaca tttaccatga ttttccttag ttactgcaga 1440
acatagagaa aaataaaagc ctaacgaata gtaaaaaaaa aaaaaaaacc tngggggggg 1500
ncccg n 1506

```

<210> 255

<211> 654

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (8)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (632)

<223> n equals a,t,g, or c

<400> 255

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actcacnta ttggaaaagc tggtagcct gcagggtccc gtccggaatt cccgggtcga 60
cccacgcgtc cgatctttcc gcgccggtga gtagcactct ctgagagctc caatttcac 120
cgtctgccat cggcgccatc ctgcaatcta agccacaatg gtgcgcatga atgtcctggc 180
agatgtcttc aagagtatca acaatgccga aaagagaggc aaacgccagg tgcttattag 240
gccgtgtccc aaagtcacgc tccggtttct cactgtgatg atgaagcatg gttacattgg 300
cgaatttgaa atcattgatg accacagagc tgggaaaatt gttgtgaacc tcacaggcag 360
gctaacaagc tgtgggggtga tcagccccag atttgacgtg caactcaaag acctggaaaa 420
atggcagaat aatctgcttc catcccgcca gtttggtttc attgtactga caacctcagc 480
tggcatcatg gaccatgaag aagcaagacg aaaacacaca ggaggggaaa tcctggggatt 540
ctttttctag ggatgtaata catatattta caaataaaat gcctcatgga caaaaaaaaa 600
aaaaaaaaaa aaaaaagggg gsgsggtctag anggtccaag cttacgtacg cgtg 654

```

<210> 256

<211> 1992

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (558)

<223> n equals a,t,g, or c

<400> 256

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gctcgccata cacctgcgca acgccatgac caccgcaag aaggaaacat accagtctgt 60
gtacaactgg cagtatgtgc actgcctctt cctgtggtgc cgggtcctga gcactgcggg 120

```

```

ccccagcgaa scctccagcc cttggtctac ccccttgccc aagtcacatc tggtctgtatc 180
aagctcatcc ccactgcccc cttctacccg ctgcgaatgc actgcatccg tgccctgacg 240
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gagcagctgt acgacctcac cctggagtag ctgcacagcc aggcacactg catcggttc 480
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gccaaactact gccggcangt gcagcagctg cttgggaagg ttcaggagaa ctcggcatac 600
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caccggggag gatattcggc agcccgggca gtcgcagatc ggaggatgca cctgcaggat 1920
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ccccaagcgc tg
1992

```

<210> 257

<211> 2273

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2271)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2273)

<223> n equals a,t,g, or c

<400> 257

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cgcggcgtcc cccaccctaa gtccacctc cggccgggca tgggtacccg ggcgggcctg 120

```

```

gctcggcctg ggccactca ctggtccaga agcagctgta ggtgccacc aagcccatga 180
cgacgctgct ggccagggtc cagccctatt caggcaggag ctgctcttct ggggtatcgc 240
gatccactta aggatgaggc agacttggtg acaagctggt ctgagcagcg cttccagagc 300
cagaactgag cccagtgaga gcgcaccctg gggcagcctg gattcctggg gtgtccccgg 360
cagccacaca cagccatgca ctacccaact gcactcctct tcctcatcct ggccaatggg 420
gcccaggcct ttcgcatctg cgccttcaat gcccagcggc tgacactggc caaggtggcc 480
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atggagacgt atgtgtactt ctatcggtea cacaaaacac aggtcctgag ttccctacgtg 720
tacaacgatg aggatgacgt ctttgcccgg gagccatttg tggcccagtt ctctttgccc 780
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gggacgctag aagggtcatg tgtaactat aatcacatth atggtttgga accatcaccc 2160
caaggtaaaa aaaaaataaa aggtattccc aggtatgttt ggcaaaataa aataaaggta 2220
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<210> 258

<211> 1504

<212> DNA

<213> Homo sapiens

<400> 258

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tattcaggga tttttttaa aagtcaatca gaaaagggat actggagctt cttcatgtat 180
gtaacagcat attaaactgg agacagtgat gaatcagcta caaaggtaat attgtattaa 240
aatcatgttt aagatagctg cttttatgtg tttttatat tgcatgcttt tgtaaaaaca 300
tgctgggtga tgaaagatta gttttagaga gaaaatgttc atctgtgcag aggatgcatt 360
ttcttccatt aattctggaa aaaacgttca cagttatata tatggtatth tgcaaaagga 420
ctattaatag aaccttttga gatgaattaa tgtaagaata ttttttaaat aggttactg 480

```

```

tcaaattgca actttttttt tagatacaga gtggaaaaca gtgctaagtc atttggcacc 540
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aaaa                                              1504

```

<210> 259

<211> 1792

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (107)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (487)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1306)

<223> n equals a,t,g, or c

<400> 259

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cgggaatccc aaaggcgctg gtgagcttca aaagtgggaa ctggggctgg gccacagccg 180
gcagcagcag catcttggtg gagtttggtt ccctgcactt ggaattctta cacctcactg 240
aactctctgg caaccaggct ttcgctgaaa aggtcaggaa catccgcaag gtcctcagga 300
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tggcgagggg ggattctgga ccacaagatg gggcacctgg cctgtttctc cgggggcatg 600
atcgcccttg gcccgaggat gccaaaggaag aaaagagggc ccactaccga gagctcgcag 660

```

```

cccagatcac caagacgtgt cacgagtcac acgcccgcctc agacacacaaa cttgggcctg 720
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catatagttt tcaaaatcat gcactttcta aaatgggtgtc atcctgaaaa acaaaaccca 1560
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ttgggcctca gtgttacaaa ttactagtgc tattttcatt attattgtaa tggaaaaatc 1740
tgtggactag aataaaagag tttattgaat aagaaaaaaa aaaaaaaaaa aa 1792

```

<210> 260

<211> 2048

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (66)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (67)

<223> n equals a,t,g, or c

<400> 260

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gcgganntgg ggtcgccccga gttgggctgg ggaagccagg gacggagggtg tccggccgtc 120
accctagag gagggcgtgc ggggggtctgt tttgcatgcg agccaccctt ctggctgctc 180
ctgcgggttc cctgtccagg aagaagcggg tggagttgga tgacaactta gataccgagc 240
gtcccgtcca gaaacgagct cgaagtgggc cccagcccag actgcccccc tgctgtttgc 300
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tatacctgca agtgtacccc gtccaggaag ccctggccgt gctggagccc taygcggcg 420
tgccccgcga caagcatgtg gctcggccca ctgaggctct ggctggtacc cagctcctct 480
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ccctgagcct gaggtgcccg tgcctctccg ccagatggcc accgccctgg cgcactgtca 600
ccagcacggt ctggctcctgc gtgatctcaa gctgtgtcgc tttgtcttcg ctgaccgtga 660
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```

```

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gccaaaggct ccaggcctct cccctgcaac tcaggacca agcccagctc actctgggaa 1680
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ttctggggac acttgggggtc cacaatccca ggtccatact ctagggtttg gataccatga 1980
gtatgtatgt ttacctgtgc ctaataaagg agaattatga aataaaaaaa aaaaaaaaaa 2040
aactcgac                                     2048

```

<210> 261

<211> 1282

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1244)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1261)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1265)

<223> n equals a,t,g, or c

<400> 261

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tagtgccagc tacgggtccgc ggctgggggt cctcctccg tttctgtatc cccacgagat 120
cctatagcaa tggaactcag cgatgcaaat ctgcaaacac taacagaata tttaaagaaa 180
acacttgatc ctgatcctgc catccgacgt ccagctgaga aatttcttga atctgttgaa 240
ggaaatcaga attatccact gttgcttttg acattactgg agaagtccca ggataatgtt 300
atcaaagtat gtgcttcagt aacattcaaa aactatatta aaaggaactg gagaattgtt 360
gaagatgaac caaacaaaat ttgtgaagcc gatcgagtgg ccattaaagc caacatagtg 420
cacttgatgc ttagcagccc agagcaaatc cagaagcagt taagtgatgc aattagcatt 480
attggcagag aagattttcc acagaaatgg cctgacttgc tgacagaaat ggtgaatcgc 540

```

```

tttcagagtg gagatttcca tgttattaat ggagtcctcc gtacagcaca ttcattatatt 600
aaaagatacc gtcatagaatt taagtcaaac gagttatgga ctgaaattaa gcttggtctg 660
gatgcctttg ctttgccctt gactaatctt ttttaaggcca ctattgaact ctgcagtacc 720
catgcaaatg atgcctctgc cctgaggatt ctgttttctt ccctsatcct gatctcaaaa 780
ttgttctata gtttaaaact tcaggatctc cctgaatttt ttgaagataa tatggaaact 840
tggtatgaata attttcatac tctcttaaca ttggataata agcttttaca aactgatgat 900
gaagaggaag ccggcttatt ggagctctta aaatcccaga tttgtgataa tgccgcactc 960
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tggaatttta ctagttacaa cgggtcaaga ggttaaatat gatttggttg taagtaatgc 1080
aattcaattt ctggcttcag tttgtgagag acctcattat aagaatctat ttgaggacca 1140
gaacacgctg acaagtatct gtggaaaagg ttattgtgcc taacatggga tttagagctg 1200
ctgatggaag aagcattgaa gtaattctga ggggttacag agngagatt tggaagggtc 1260
nggtnttggt actagacgca gg                                     1282

```

<210> 262

<211> 599

<212> DNA

<213> Homo sapiens

<400> 262

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ggcacgagcc ccggcagagg cggargcgga gtcggcctga gaggtctctc gtcgctgcag 60
gcgcctcagc ccagccgcgt gccttggccc atggccgcct actcttaccg ccccgccct 120
ggggccggcc ctgggcctgc tgcaggcgcg gcgctgccgg accagagctt cctgtggaac 180
gttttccaga gggctgataa agacaggagt ggagtgatat cagacaccga gcttcagcaa 240
gctctctcca acggcacgtg gactcccttt aatccagtga ctgtcaggtc gatcatatcc 300
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tacatcacgg actggcagaa cgtcttccgc acgtacgacc gggacaactc cgggatgac 420
gataagaacg agctgaagca ggccctctma gtttcggcta ccggtctctc kaccagttcc 480
acgacatcct cattcgaag kttgacaggc argggacggg gcaratcgsc ttcgacgast 540
taatccaagg ctggcatggc ctgcagaggt ttacggatat attcaaagg ttcggcacg 599

```

<210> 263

<211> 1261

<212> DNA

<213> Homo sapiens

<400> 263

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ggcacgaggt tgttcggagc gggcgagcgg agttagcagg gctttactgc agagcgcgcc 60
gggcactcca gcgaccgtgg ggatcagcgt aggtgagctg tggccttttg cgaggtgctg 120
cagccatagc tacgtgcgtt cgctacgagg attgagcgtc tccacccagt aagtgggcaa 180
gaggcggcag gaagtgggta cgcagggcg caaggcgcac agcctctaga cgactcgctt 240
tccctccggc caacctctga agccgcgtcc tactttgaca gctgcagggc cgcggccttg 300
tcttctgtgc ttcaccatct acataatgaa tcccagtatg aagcagaaac aagaagaaat 360
caaagagaat ataaagaata gttctgtccc aagaagaact ctgaagatga ttcagccttc 420
tgcactctgga tctcttggtg gaagagaaaa tgagctgtcc gcaggcttgt ccaaaggaa 480
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tagtgaatat aaaaatcttg gaggagtcac ccaggagtca tttgatctta tgattaaaga 600
aaatccatcc tctcagtatt ggaagggaagt ggcagaaaaa cggagaaagg cgctgtatga 660
agcacttaag gaaaatgaga aacttcataa agaaattgaa caaaaggaca atgaaattgc 720
ccgcctgaaa aaggagaata aagaactggc agaagtagca gaacatgtac agtatatggc 780
agagctaata gagagactga atggtgaacc tctggataat tttgaatcac tggataatca 840

```

ggaatttgat tctgaagaag aaactgttga ggattctcta gtggaagact cagaaattgg 900
cacgtgtgct gaaggaactg tatcttcctc tacggatgca aagccatgta tatgaaatgc 960
attaatatatt gactgttgag aattttactg ccgaagtta cctccactag ttctttgtag 1020
cagagtacat aactacataa tgccaactct ggaatcaaat ttccttggtt gaatcctggg 1080
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aggattttct cagttgtcag ccatgactta tgtttattac taaataaact tcaaaactct 1200
gttgaacatt gtgtataact tagaataatg aaatataagg agtatgtgta gaaaaaaaaa 1260
a 1261

<210> 264

<211> 1020

<212> DNA

<213> Homo sapiens

<400> 264

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tattccttcc tctttatctc acaatttttg tctccactaa gcaagaagta aactaacact 180
tcgtcactct aaagaaataa cttatgtaaa actcttagta accctgtttg tcttcaaagt 240
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tcaacatttt gaaatgcaga gggatttggg acatgacgac atggaaaagg gcacttttaa 360
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attcttttta aagcccaagg gatggagcaa aggtgtaagg atgttacctg tttgttttaa 480
tcagagagca aaaagaagtc acaatagttt gggagaaaaa gtagtatggt gagtaagggt 540
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gcataactgt attttttgtt ttagggcctt attgatgttt tgccgttcca atgtatgcat 720
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<210> 265

<211> 571

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (557)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (565)

<223> n equals a,t,g, or c

<400> 265

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caagggcacg agcatcgggc catgcctttc ttggacatcc agaaaagggt cggccttaac 120


```

atagatcgat ggttgacaat ccagagtggg gaacagccct acaagatggc tggtcgatgc 180
catgcttttg aaaaagaatg gatagaatgt gcacatggaa tcggttatac tcgggcagag 240
aaagagtgcag agatagaata tgatgatttc gtagagtgtt tgcttcggca gaaaacgatg 300
agacgtgcag gtaccatcag gaagcagcgg gataagctga taaaggaagg aaagtacacc 360
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tctggaggct gattttcctg ttctctgttc tccactggaa aggttggtta cgacaaacct 480
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aaaatttggg ggggggnccc cgtancccat t 571

```

<210> 266

<211> 1350

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (204)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1313)

<223> n equals a,t,g, or c

<400> 266

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ctgccgagct cagaggagac cccagacccc tcccgcagcc agagggctgg agcctgctca 180
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cggctggaac gagttcatcc tgcagcccat ccacaacctg ctcattgggtg acaccaagga 360
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tgaccttctg cggtccggg ctgtgtccta aatgcaaagc acacctcgcc gagcctgcgc 1140
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tgacttcttt actaacactg gctagctata ttatcttata tactaatatc atgttttaaa 1260
aatataaaat agaaattaag aatctaaawa aaawaaaaaa acggggggcg cntntaaagg 1320
tccaagctta acgtaagcgt gcatgggaag 1350

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<210> 267

<211> 1319

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (7)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (61)

<223> n equals a,t,g, or c

<400> 267

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nccgctctag aactagtgga tccccgggc tgcaggaatt cggcacgaga gactccgcga 120
cctactgacc cggcgactga caggctccaa ctacccggga ctcagtatta gccttcgcct 180
cactggctcc tctgcacaag aggmggcttc cggagtagcc ctcggtgaag cccagacca 240
cagctatgag tcccttcgtg tgacgtctgc gcagaaacat gttctgcatg tccagctcaa 300
ccggcccaac aagaggaatg ccatgaacaa ggtcttcttg agagagatgg tagagtgctt 360
caacaagatt tcgagagacg ctgactgtcg ggcggtggcg atctctggtg caggaaaaat 420
gttcaactgca ggtattgacc tgatggacat ggcttcggac atcctgcagc ccaaaggaga 480
tgatgtggcc cggatcagct ggtacctccg tgacatcatc actcgatacc aggagacctt 540
caacgtcatc gagaggtgcc ccaagcccgt gattgctgcc gtccatgggg gctgcattgg 600
cggaggtgtg gaccttgtca ccgcctgtga catccggtag tgtgcccagg atgctttctt 660
ccaggtgaag gaggtggacg tgggtttggc tgccgatgta ggaacactgc agcgctgcc 720
caaggtcatc ggaaccaga gcctggtcaa cgagctggcc ttcaccgccc gcaagatgat 780
ggctgacgag gccctgggca gtgggctggt cagccgggtg tccccagaca aagaggtcat 840
gctggatgct gccttagcgc tggcgccga gatttccagc aagagccccg tggcgtgcag 900
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gtggcgctcct ggaacatgag catgctgcag acccaagacc tcgtgaagtc ggtccaggcc 1020
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cccaggcccc agccagggg ccggccttgt ccgcctcat ccacagaaag ggaggatggg 1140
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gagttttctca agcccaaggc cttatcttca cccacaaac aataaagcaa agtaaagaaa 1260
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaagg gggggggggc 1319
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<210> 268

<211> 3694

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (746)

<223> n equals a,t,g, or c

<400> 268

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gaggtgtggc ggagcctgtg cgcccgcagc ctggcagaag aggctctgcg caccgacatc 120
ctgtgcaacc tgcccagcta caaggccaag atacgtgctt ttcaacatgc cttcagcact 180
```

```

aatgactgct ccaggaatgt ctacattaag aagaatggct ttactttaca tcgaaacccc 240
attgctcaga gcactgatgg tgcaaggacc aagattgggt tcagtggagg ccgccatgca 300
tggaagtgt ggtgggagg ccctctgggc actgtggcag tgattggaat tgccacaaaa 360
cgggcccca tgcaagtcca aggttatgtg gcattgctgg gcagtgatga ccagagctgg 420
ggctggaatc tgggtggaca taatctacta cataatggag aagtcaatgg cagttttcca 480
cagtgcaca acgcaccaa atatcagata ggagaaagaa ttcgagtcac cttggacatg 540
gaagataaga ctttagcttt tgaacgtgga tatgagttcc tgggggttgc ttttagagga 600
cttccaaagg tctgcttata ccagcagtt tctgctgtat atggcaacac agaagtgact 660
ttggtttacc ttgaaaaacc tttggacgga tgacagtggc tttcttgtga tgacmgacas 720
aatggaggag agatctgctt atgggnaakt asaaccatga agtgactgtc acacatgcat 780
gtccaagaaa catcctgaaa acacatgaag tcgtaaactg gagaagcagc tctacagcag 840
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tgagtgggca gttgacatat gcatgttgca ccgatgttg tctctaagtt agcaatgtgt 960
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gatttttaag tagtgtgttt gtgaagactg atcccatttt acaactgcct gttctttctc 1080
cagtcctttt ttttccagcc agcttgacta ttagaaaagt atgaaactgg ttgggtttta 1140
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tgccgtggat gaaaagtgct attaaaagtc aaaggagtgt tctgtttcaa ttcatagtat 3420
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tggttggtta acgaagcatg cagatgtgga agcagacgtt actattatcc ctactatggt 3540
cttctgtcat actgagacag gctgttttaa ttacctggtt ttacatagga aagaagaaat 3600
attaaggctt aaagtgtgta atgatcaatg gctcataatt cattaaatct tttcatacaa 3660
ggaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaa                                     3694

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<210> 269

<211> 1242

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (31)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (46)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (460)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1233)

<223> n equals a,t,g, or c

<400> 269

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ttttgtattg atatatgtac tgtgtgtgtc tgtgtgtgtg agatcaagat cagggtttga 180
ttggtgatgt actattactg ttgtccttgg tcaggggacac agaggatgtt tggggtttgg 240
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gaagcatcag caccgtgaac ttgtctgaga atagcagtgt tgtcatcccc ccaccgact 360
acttggaatg cttatccatg ggggcagytg ccgacaggag agcagattcg gccaggacga 420
catccacctt taaggcccca gcgtccaagc ccgagaccgn ggctcctaac gatgccaacg 480
ggactgcaaa gccgcctttt ctcagcggag aaaacccctt tgccactgtg aaactccgcc 540
cgactgtgac gaatgatcgc tcggcaccca tcattcgatg agaggacagc caaggactct 600
cccgggcctc tccggttctc ccttgcgga tgatgggcgc atcctgtctg ccacgtgctg 660

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```

acgggtcggga agcttcagtg gagaggccta actctaattgt cgcttgctta agcaaatacat 720
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gtctaatagac cagctcagcc atttaaaata ttttcttctt attctgttca agaaacagta 840
aacttggttt caatctttac tgtatttttt aaatgaattt tttccttaat aacagccaga 900
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atgtaattta acttaaaatg tttaagtgtg gagcttccag agrtgggagg aaacccccac 1140
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```

<210> 270

<211> 2057

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (22)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2053)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2054)

<223> n equals a,t,g, or c

<400> 270

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cggagcgggt tgtaatgtat tinctggattt tattttgctg tattagctcc tcaagagtta 60
ctgatctatg aaatggcaga gaatggaaaa aattgtgacc agagacgtgt agcaatgaac 120
aaggaaacatc ataatggaaa tttcacagac cctcttcag tgaatgaaaa gaagaggagg 180
gagcgggaag aaaggcagaa tattgtcctg tggagacagc cgctcattac cttgcagtat 240
ttttctctgg aaatccttgt aatcttgaag gaatggayct caaaattatg gcatcgtaaa 300
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ggagtgcata aacagtatgt gcaacgtata gagaaacagt ttcttttgta tgcctactgg 420
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tatctgggtc cacatatagc ctcagttaca ttagctgctt atgaatgcaa ttcagttaat 540
tttcccgaac caccctatcc tgatcagatt atttgtccag atgaagaggg cactgaagga 600
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ggtacagcaa tcggagagct gcctccatat ttcattggyca gagcagctcg cctctcaggt 720
gctgaaccag atgatgaaga gtatcaggaa tttgaagaga tgctggaaca tgcagagtct 780
gcacaagact ttgcctcccg ggccaaactg gcagttcaaa aactagtaca gaaagtggga 840
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ccatttcagg agtacctgga ggctcaacgg cagaagcttc accacaaaag cgaaatgggc 1140

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```

acaccacagg gagaaaactg gttgtcctgg atgtttgaaa agttggtcgt tgtcatggtg 1200
tgttacttca tcctatctat cattaactcc atggcacaaa gttatgcaa acgaatccag 1260
cagcggttga actcagagga gaaaactaaa taagtagaga aagttttaaa ctgcagaaat 1320
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ggccatttta tgatgcattg cacaccctct ggggaaattg atctttaaat tttgagacag 1860
tataaggaaa atctggttgg tgtcttacia gtgagctgac accatttttt attctgtgta 1920
tttagaatga agtcttgaaa aaaactttat aaagacatct ttaatcattc caaaaaaaaa 1980
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaggaaaa 2040
aaaaaaaaaa aannaaa 2057

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<210> 271

<211> 960

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (31)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (951)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (956)

<223> n equals a,t,g, or c

<400> 271

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ccgctctaga actagtggat ccccccgggct gcaggaattc ggcacgagct cttccacccc 120
tgccaggccc agcagccacc acagcgcttg ctctctcggc cctgaaatca tgcccctagg 180
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ctcagacctg atcccagccc cacctctgag caaggctcct ctgcagcaga acttccagga 300
caaccaattc caggggaagt ggtatgtggt aggcctggca gggaatgcaa ttctcagaga 360
agacaaagac ccgcaaaaga tgtatgccac catctatgag ctgaaagaag acaagagcta 420
caatgtcacc tccgtcctgt ttaggaaaaa gaagtgtgac tactggatca ggacttttgt 480

```

```
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gacttcggaa ctaaaggaga acttcatccg cttctccaaa tctctgggcc tccctgaaaa 720
ccacatcgtc ttccctgtcc caatcgacca gtgtatcgac ggctgagtg acaggtgccg 780
ccagctgccg caccagcccc aacaccattg agggagctgg gagaccctcc ccacagtgcc 840
acccatgcag ctgctcccca ggccaccccg ctgatggagc cccaccttgt ctgctaaata 900
aacatgtgcc ctcaggaaaa aaaaaaaaaa aaaaaaaaaa aagggggggg nccccntccc 960
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<210> 272

<211> 1167

<212> DNA

<213> Homo sapiens

<400> 272

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cggcgcgggg aaatcggctg tgggagagag gctaggcctc tgaggaggcg aatccggcgg 120
gtatcagagc catcagaacc gccaccatga cgggtgggcaa gagcagcaag atgctgcagc 180
atattgatta caggatgagg tgcattctgc aggacggccg gatcttcatt ggcaccttca 240
aggcttttga caagcacatg aatttgatcc tctgtgactg tgatgagttc agaaagatca 300
agccaaagaa ctccaaacaa gcagaaaggg aagagaagcg agtcctcggg ctggtgctgc 360
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ttgctcgagt tccacttgct ggagctgccg ggggccagg gatcggcagg gctgctggca 480
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gtgggggttg cgggccatcc caacaggtga tgacccaca aggaagaggt actgttgag 600
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aaaaactyrr gggggggccc ggtccca 1167
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<210> 273

<211> 2771

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (16)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (27)

<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (42)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (64)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2715)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2717)
<223> n equals a,t,g, or c

<400> 273
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ccagcagtc ttcagggaa atgggaggcg aggagaagcc gattggtgct ggtgaagaga 240
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cagaacatga ttccattctg gcagaaaagg cagaaaaaga tagcaagcca attaaagtca 420
ctttgcctga tggtaaacag gttgatgcgg aatcttggaa aactacacca tatcaaattg 480
cctgtggaat tagtcaaggc ctggccgaca acaccgttat tgctaaagta aataatgttg 540
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atgaggaagc tcaggcagtg tattggcact ctagtgtcga cataatgggt gaagccatgg 660
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taagccgaat t 2771

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<210> 274

<211> 1889

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (15)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (57)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (87)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (113)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1676)

<223> n equals a,t,g, or c

<400> 274

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gttcggaaac ctatcgatta cacagtnctg gatgatgtgg gccatggtgt cangcatgga 120

```

```

aatagaccag cctgcaggaa ctggcacact gtcgagaaca aatcctccta ctcagaaacc 180
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<210> 275

<211> 604

<212> DNA

<213> Homo sapiens

<400> 275

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tcctgccatc ctctcaacag ctctgtgggg tgggtcctcc ccataacctg atgcaccgac 180
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atgggaccac agccactgtg ccctgccgtt tcctgctggg cccctgcata tggccctgag 480
cctggggctg ccacgtgttt aggaacaaaa gtatgcgcta ctgtctgaaa acaaataaag 540
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<210> 276

<211> 1381

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1348)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1349)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1350)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1358)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1359)

<223> n equals a,t,g, or c

<400> 276

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tcaagcttgg aatccacgaa gactccacta accgccgccg cctgtctgag ctgctgcgct 240
atcatacctc ccagtctgga gatgagatga catctctgtc agagtatgtt tctcgcatga 300
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cagcttttgt ggagcgagtg cggaaacggg gcttcgaggt ggtatatatg accgagccca 420
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aggtgacaat ctccaataga cttgtgtctt caccttgctg cattgtgacc agcacctacg 660
gctggacagc caatatggag cggatcatga aagcccaggc acttcgggac aactccacca 720
tgggctatat gatggccaaa aagcacctgg agatcaacct tgaccacccc attgtggaga 780
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gggtgtcaag cccattccc tctctactct tgacagcagg attggatgtt gtgtattgtg 1260
gtttatttta ttttcttcat tttgttctga aattaaagta tgcaaaataa agaatatgcc 1320
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c 1381

<210> 277
<211> 1149
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (680)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1088)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1098)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1140)
<223> n equals a,t,g, or c

<400> 277
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atgtcaaaaag gcactgatga agatattttc tctggagtct ccttctttct aaccgggctc 180
tcccgatgtg aaccgagccg tcgtccgccc gccgccgccg ccgccgccgc cgccgccgcg 240
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gggagctcca gaaggggatc atgacctcct cacctgtggg cagtgccaga tgaacttccc 420
attgggggac attcttattt ttatcgagca caaacggaaa caatgcaatg gcagcctctg 480
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caatcccgtg gaggttgga tccaggtcac gccagaggat gacgattgtt tatcaacgtc 600
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<210> 278

<211> 811

<212> DNA

<213> Homo sapiens

<400> 278

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ccggtcascc ctggcaatcc caccaaatca tcctgaatct gatcttttta tacacaatat 780
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<210> 279

<211> 1260

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1249)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1252)

<223> n equals a,t,g, or c

<400> 279

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ccacttityt tgacagtcca gcccacctcc tcttctgccc ggagaagctc cagggggtgc 180
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cgtgaccaca tctttaaaat gacctatttc gtggctycca caagatttac acctycacac 300
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aaacgccacg taatgagtca aagctgtggc gcacgcgcag aagtacaagc taccggaagt 420
gatggcgccc ctactaaagc cttgggggta gtacgcgtcg cagcagcttc ttccgacagt 480
tgtgttgtgc caatggtgga gaagaaaact tcggttcgct cccaggaccc cgggcagcgg 540
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gagggcccta actacctgac ggcctgtgcg ggaccccat cgcggcccca gcgcccttc 840
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actgtgcgct gtctggggac ccaccaggag accagggtgtc tgaagtggac tgtgtgagcc 960
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acaaaactgt gtcttatctg ccaggaaaga ccagcctcac tcctgggaac tgtctggcag 1140
gtaggctggg cccccagtg ctgttagaat aaaaagcctc gtgccggaac aaaaaaaara 1200
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaant tngggggggg 1260

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<210> 280

<211> 1668

<212> DNA

<213> Homo sapiens

<400> 280

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ttgattgtsa cagcaagatc aaataacaaa acgaagcata ttgaagaaga gaacttgatt 180
gacgaagact ttcaaaatct aaaactgcgg tcgacaggct tcaccaatct tggagcagaa 240
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aagcttttac aaatgttatt agtgtccttt tttatttcta atgccttgct ctcttaaaag 1560
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agtgcctttg ttagatggaa aaaaaaaaaa aaaaaaaaaa aaaaaaaa 1668

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<210> 281

<211> 2328

<212> DNA

<213> Homo sapiens

<400> 281

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gaagcatata aactccgtgc agccagatta gtagaaattg ctgcaaaaaa ccttcaaaaa 180

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gaagtgattc acagaaaaag caaggaggta gcttgaacc taacttctgt tgacctgtgt 240
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aaaattcaag ataaagccat tcaagctgtc ttaaggagtt tatgtctgct gtattctctg 360
tatggaatca gtcagaacgc gggggatttc cttcagggga gcatcatgac agagcctcag 420
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<210> 282

<211> 956

<212> DNA

<213> Homo sapiens

<400> 282

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<210> 283

<211> 1402

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (26)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (88)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (97)

<223> n equals a,t,g, or c

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<221> misc feature

<222> (131)

<223> n equals a,t,g, or c

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<222> (1344)

<223> n equals a,t,g, or c

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<221> misc feature

<222> (1355)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1394)

<223> n equals a,t,g, or c

<400> 283

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<210> 284

<211> 675

<212> DNA

<213> Homo sapiens

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<220>

<221> misc feature

<222> (520)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (560)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (618)

<223> n equals a,t,g, or c

<400> 284

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<210> 285

<211> 1339

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1330)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1331)

<223> n equals a,t,g, or c

<400> 285

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gatggtctcg gggacctccg ccgccgtgga agagtacagt tgtgaatttg gctccgcgaa 180
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aaaaaaaaan naaaaaaaaa 1339

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<210> 286
<211> 1398
<212> DNA
<213> Homo sapiens

<400> 286
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aaaaaaaaaa aaaaaaaaaa 1398

<210> 287
<211> 926
<212> DNA
<213> Homo sapiens

<220>
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<222> (20)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (22)
<223> n equals a,t,g, or c

<220>
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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (917)

<223> n equals a,t,g, or c

<400> 287

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<210> 288

<211> 3094

<212> DNA

<213> Homo sapiens

<400> 288

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<210> 289

<211> 1983

<212> DNA

<213> Homo sapiens

<400> 289

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gga 1983

<210> 290

<211> 1298

<212> DNA

<213> Homo sapiens

<220>

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<220>

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<222> (1231)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1242)

<223> n equals a,t,g, or c

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<221> misc feature

<222> (1262)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1285)

<223> n equals a,t,g, or c

<400> 290

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<210> 291

<211> 2459

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (3)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1604)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1605)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2374)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2392)

<223> n equals a,t,g, or c

<400> 291

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```


<210> 292

<211> 570

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (567)

<223> n equals a,t,g, or c

<400> 292

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aattcggcac gmgccggagt gtggtacttc tcctagttgc agtcaggctt catacgctat 60
tgtcctgccc gttagagcag ccagcgggta cagaatggat ttggaagag ggagtcacca 120
ctggacctcc aaggaagcca cgtgcagaca tctacaacct tcgatctcct gacgagtta 180
ttgttgGCCa aaaccaggct ttgattgaac caggatgaat gcgggtgttg gaagtagaat 240
atatatatac atataaaatt ggttgggagc cacgtgtacc agtgtgtgtt gatcttggct 300
tgattcagtc tgccttgtaa cagaaactgg cgatggaata tgagaggagc cctctggaaa 360
gaaaaggaca gacctgtgc tttcatgaaa gtgaagatct ggctgaacca gttccacaag 420
gttactgtat acatagcctg agtttaaaag gctgtgccc cttcaagaat gtcattgtta 480
gactttgaaa tttctaactg cctacctgca taaagaaaat aaaatctttt aaatcaaaaa 540
aaaaaaaaa raagggggcc gctctanagg                    570
```

<210> 293

<211> 2468

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2076)

<223> n equals a,t,g, or c

<400> 293

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aggacaggag gtggccatta agcagatgaa tcttcagcag cagcccaaga aagagctgat 120
tattaatgag atcctggtca tgagggaaaa caagaaccca aacattgtga attacttgga 180
cagttacctc gtgggagatg agctgtgggt tgttatggaa tacttggtg gaggctcctt 240
gacagatgtg gtgacagaaa cttgcatgga tgaaggccaa attgcagctg tgtgccgtga 300
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gagcaccatg gtaggaaccc catactggat ggcaccagag gttgtgacac gaaaggccta 420
tgggcccaag gttgacatct ggtccctggg catcatggcc atcgaaatga ttgaagggga 480
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cccagaactt cagaacccag agaagctgtc agctatcttc cgggactttc tgaaccgctg 600
tctcgagatg gatgtggaga agagagggtt agctaaagag ctgctacagc atcaattcct 660
gaagattgcc aagcccctct ccagcctcac tccactgatt gctgcagcta aggaggcaac 720
aaagaacaat cactaaaacc aactcacc cagcctcatt gtgccaagcc ttctgtgaga 780
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aagagaactg caactgaatg actaatcaga tgatggccat ttctaaataa ggaatttcct 960
cccaattcat ggatatgagg gtggtttatg attaagggtt tatataaata aatgtttcta 1020
```

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gcttgctttt ctgtgactca actgcccaga cacctcattg tacttgaaaa ctggaacagc 1200
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taaaaaaa 2468

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<210> 294

<211> 1080

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1038)

<223> n equals a,t,g, or c

<400> 294

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caggccagca gacagtgggt tttgctggac acagtgggga tgtgatgtcc ctgtcccttg 180
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ccccgggcca cggggccttg ggtccctgcc ctcccaccca ggtttggttc ctcccggggc 780
ccccactgtg gagataagaa ggggatggaa tgggggaaga ggaggagcag gaggccctca 840

```

tccttctgct gccctggggt tggggcctca cccctctgga gggccggagg caggaggtgg 900
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tttttccata aaggagccaa ttccaactct gwaaaaaaaa aaaaaaaaaa acttcgrggg 1020
ggggcccgta cccaattngc ctttaggggg gggtttaaata taatggcggg gttttaaaaa 1080

<210> 295

<211> 2695

<212> DNA

<213> Homo sapiens

<400> 295

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tccatatata cagaaattag acaataata agtctttagt tcaacttaag catatctcaa 180
atgacttctc taaattttaa gttgatcatg ataggatcat aaaagacaga aaagacttaa 240
gtaatcttgt aatgacaatt atttccattt ttgctgaact aaaaatattt aacttcataa 300
atatgttact acagcttcca gatttaaaga aaaaaagttt cccccactct caattaaaag 360
ttagaaccct ccacttttaa aattatacaa atatttcttt ttacattac acagaagcct 420
tctgtaccat ttacgaatt tctgtcttca taatataagt gaaaatactg tcatttcaat 480
tttctgcttt aaattgtttt taataagcat yccaaagtga tacagactta agcttttaaat 540
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cagtaacctg tgcgacttta tgcagaagac aaatgctagt aattattatg cacagaggaa 660
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ttctaactac aaaaaaaaaa aagtcgacac cgccgggaat ttaggtgtag tagtcccccg 2640
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<210> 296

<211> 1394

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1238)

<223> n equals a,t,g, or c

<400> 296

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ggacaagttc attgaagact atctcttgcc agacacgtgt ttccgcatgc aaatcaacca 180
tgccattgac atcatctgtg ggttcctgaa ggaaaggtgc ttccgaggta gctcctaccc 240
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gagagcattt tccgtgaagt ttgaggtcca ggctccacgc tggggcaacc cccgtgcgct 480
cagcttcgta ctgagttcgc tccagctcgg ggaggggggk gagttcgatg tgctgcctgc 540
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acaccaaaaa aaaa

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1394

<210> 297

<211> 998

<212> DNA

<213> Homo sapiens

<400> 297

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ggcacgaggt gaaataacgg gcccatataa atccctctgc cgccgcctg caagatggat 60
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acattccttg tgacgactgc gcatgctcgg aaaggggacg caatcragat cccaaacgcg 180

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gtacagacca aaccgcagtc cacgttacgg atcggttac tccgcggagt tggcctcatt 240
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aaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 998

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<210> 298

<211> 1666

<212> DNA

<213> Homo sapiens

<400> 298

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<210> 299

<211> 2444
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (4)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (402)
<223> n equals a,t,g, or c

<400> 299
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251

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<210> 300

<211> 1026

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1026)

<223> n equals a,t,g, or c

<400> 300

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<210> 301

<211> 830

<212> DNA

<213> Homo sapiens

<400> 301

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agtggcagtg ctgagtttca tcctctccag tgcggccaag cacagtgtcg atggcgaaac 180
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agcccagcct gttgccatgt ccctctcagc agacaagtgc caggctcctc tggcagaact 480
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gtggagccgc cctgcccgtg tggagtcacg ccctctgaac tgctcttcgg gaggcagccc 600
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<210> 302

<211> 3300

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (1158)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3232)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (3280)

<223> n equals a,t,g, or c

<400> 302

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<210> 303

<211> 475

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (444)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (451)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (454)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (470)

<223> n equals a,t,g, or c

<400> 303

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<210> 304

<211> 2902

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2888)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2891)

<223> n equals a,t,g, or c

<400> 304

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<210> 305

<211> 1553

<212> DNA

<213> Homo sapiens

<400> 305

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tccctccctg ggccgggctg gcaactcttg cttccccgtc cctcatggcg ctgctccgac 180
gcccagcggg gtccagtgat ttggagaata ttgacacagg agttaattct aaagttaaga 240
gtcatgtgac tatttaggca actgttttag aagaaatttg aaatagagtt acaaccagag 300
cagcacaagt agctaagaaa gctcagaaca ccaaagttcc agttcaaccc accaaaaaca 360
caaagtcaaa caaacaactg aaacctactg cttctgtcaa accagtacag atggaaaagt 420
tggctccaaa gggctcctct cccacacctg aggatgtctc catgaaggaa gagaatctct 480
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agaaccctca gctctgcagt gactacgtta aggatatcta tcagtatctc aggcagctgg 600
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gtgccatcct agtggattgg ctggtacaag tccactccaa gtttargctt ctgcaggaga 720
ctctgtacat gtgcgttggc attatggatc gatttttaca ggttcagcca gtttcccgga 780
agaagcttca attagtggg attactgctc tgctcttggc ttccaagtat gaggagatgt 840

```

```

tttctccaaa tattgaagac tttgtttaca tcacagacaa tgcttatacc agttcccaaa 900
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cactacactt cttaaggcga gcatcaaaag ccggggaggt tgatgttgaa cagcacactt 1020
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acatggccaa gaatgtggtg aaagtaaatg aaaacttaac taaattcatc gccatcaaga 1260
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ccgtcaaaaga ccttgccctcc ccactgatac gaaggtccta ggctgccgtg gcccctgggg 1380
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cctctggtct atctcatgaa acctcttctc agaccagttt tctaaacata tattgaggaa 1500
aaataaagcg attggttttt cttaaggtaa aaaaaaaaaa aaaaaaactc gag 1553

```

<210> 306

<211> 1987

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (731)

<223> n equals a,t,g, or c

<400> 306

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cagtcaaatg cagtctggct tcttggacat ctctcatctat ctactctatc ctcaagtcaa 60
agtagagcct ctgttcctac tgactatagc tacttgccctg aaagcagttt tattggagca 120
gctattggct tcttcattac aggaggaaaa aaaggtcctg aatctgtgcc tccttccctt 180
cttaaagtag tgatgaaacc catagcaact gttggagaaa gctaccaata tcctcctgtg 240
aactgggctg cacttctctc tccacttatg aggctaaatt ttggtgaaga gatccagcaa 300
ctgtgccttg aaattatggt gaccagggca cagtcattcc agaatgcagc tgcactattg 360
ggcttgtggg tgacaccacc actgatccac agtctgagtc tgaataccaa gagatatctc 420
ctgatatctg cacctctgtg gataaaacac atctctgatg aacagatcct gggttttgtt 480
gaaaatttaa tgggtggcagt ttttaaagca gcttccccac ttggaagtcc tgagctatgc 540
ccaagtgctt tacacggtct gagccaggcc atgaaactgc ccagccctgc ccaccacctc 600
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gatgccaatc nggatcgccc aggttactaa gagcaacata gaaaaagctg cttttgtcaa 780
actgtactta gtctctcaag gacgattccc cttggtgaac ctgaaccgat atgctgagcg 840
ttgctgtgca gcaccgtgag aaagaggtgt tggcctggat gattctgcac agcttatacc 900
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aactgatggg ttatattaga aatgttgctt accagtcaac atcctttcac aatacggctc 1020
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tcccagagtt taagaagaaa gctgtatgga ccagagcata tggttggtga acagttttgc 1440
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gaattcatgc ctggtattgc tgagacatga tgagagagtg taagggtcat gaaaagatgg 1560
ccacatcact gacagcttga cacatgcctc ctaagagagg agtgcatctc tttagtacc 1620

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```

gggccagttg agactgaaac aggaacttgg attttcttta tttggcttga gttcaatgtg 1680
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aatgttggtca attttgtgcg tgtgactttt gttttaaggc atgggggaag gtgccagaac 1800
cacttggtga caatggcatt atgatctatt ttccatgaat ctccatgagg atattcattg 1860
actcagttag ttagacaaat ttccttattg ataaaacact ctcttggaac tgctatacac 1920
atttaaataa taagcataac attgaatatt agctaaatca gattcattaa tgggtgtctat 1980
catttcc
1987

```

<210> 307

<211> 785

<212> DNA

<213> Homo sapiens

<400> 307

```

gcgcgacccg ccccggtccc tccagtctgg cctgggcgcc gcgggaacgc tgtcctgggt 60
gccgccaccc gaacagcctg tcctggtgcc ccggctccct gccccgcgcc cagtcatgac 120
cctgcgcccc tcaactcctc cgctccatct gctgctgctg ctgctgctca gtgcggcggt 180
gtgccggggt gaggtctggc tcgaaaccga aagtcctcgc cggaccctcc aagtggagac 240
cctggtggag cccccagaac catgtgccga gcccgctgct tttggagaca cgcttcacat 300
acactacacg ggaagcttgg tagatggacg tattattgac acctccctga ccagagaccc 360
tctggttata gaacttggcc aaaagcaggt gattccaggt ctggagcaga gtcttctcga 420
catgtgtgtg ggagagaagc gaagggaat cattccttct cacttggcct atggaaaacg 480
gggatttcca ccactctgtc cagcggatgc agtggtgcag tatgacgtgg agctgattgc 540
actaatccga gccaaactact ggctaaagct ggtgaagggc attttgcctc tggtagggat 600
ggccatgggt ccagccctcc tgggcctcat tgggtatcac ctatacagaa aggccaatag 660
acccaaagtc tccaaaaaga agctcaagga agagaaacga aacaagagca aaaagaaata 720
ataaataata aattttaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 780
aaaaa
785

```

<210> 308

<211> 2178

<212> DNA

<213> Homo sapiens

<400> 308

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ggcagaggrc gggaagaccg agtggctctt tggcatggat gagggccgga aacagctggc 60
ggccagtgtc ggcttcagga ggttgattac agtggccctt caccgaggtc agcagtatga 120
aagcatggac cacatccaag ctgagctgtc rgctagagtc atggagctgg cccagctgg 180
gatgccacc cagcagcagg tcccctttct gtctgtgggt ggggacattg gggtcggac 240
cgttcagcac caagactgca gcccttgag cggtgactat gtcattgagg atgtgcaagg 300
ggatgacaag cgatacttcc gtcgactgat ctctctcagc aacaggaatg tgggtgcagtc 360
cgaagccagg ttgtgaagg atgtgtctca caaagcccag aagaagcggg aaaaggacag 420
gaagaagcag cggcctgctg atgcggagga cctccctgca gccccggggc agtccattga 480
taagagttac ctgtgtgtg aacaccacaa agccatgata gctggccttg ccctgctgag 540
aaaccagag ctactcctag agatccact ggcattgttg gtggtaggcc tgggcggggg 600
cagcctcccc ctctttgtcc acgatcattt tccaaagtcc tgcattgatg ctgtggagat 660
cgatccctcc atgttggaag tggccaccca gtggtttggc ttctccaga gtgaccgaat 720
gaaggtccac attgcagatg gcctggacta tatcgccagc ttggcaggag gaggagaagc 780
acggccttgc tacgatgtca taatgtttga tgttgacagt aaggaccaa cactgggaat 840
gagttgtccg cccccagcat ttgtggagca atcttttcta cagaaggtta aaagcatctt 900
gactcctgaa ggtgttttta ttctcaacct tgtgtgccga gacttggggc taaaagactc 960

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agtgtctggct gggctcaagg cagtgttccc cctcctatat gtccggcgaa ttgaggggtga 1020
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cctagaaaca gcccaggctt tggagcggac cctgaggaaag cctgggaggg gttgggatga 1140
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gataaaggat acttaagccc aaactatatac taaacccaaa tctcacttgg ctggaaacat 2100
caatcttaac catttattca gaaccattaa accaatgatt ccaaaaaaaaa aaaaaaaaaa 2160
aaaaaaaaaa aactcgta 2178
```

<210> 309

<211> 875

<212> DNA

<213> Homo sapiens

<400> 309

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tcctgcggac cagtctctga atgttcaaag atgagggcct ggcttccgtg ctctggcttt 120
gtaacttatc tgggaaggaa agcacatgcc ttcacgggca gggatgttct cttttcttct 180
cgggggtgtg acttgcatc ctgtgtgaac tgttccctct gccatgttta ccgtgtgatg 240
ttctgtagtt gaaaatgtta gttgtctgct ggcacagaat ttatctcgtt cttttctctc 300
ccttctctcc tccaaatcag tctcttccct tctccactag ataactgtaa aaccttttcc 360
tggggtacat acattcggtta aytcttgggc agtggtgagc acgagatgac tttctgcagc 420
gtttatcact gttgggtgga gtcacgtccc ttcctccac cgaagtcac aaccagatag 480
ggaagggaaa gatgaggccc agaaaacgag ttcaaactct aggtcttgta cacgtatgta 540
agtaaatgtc aataacccaa gcctttgtca tagcagtcac ttggttgact taggatctgg 600
gtctgttgaa ttttgtgctt ggggaatggag ctggagggag tggggcctgt gtacagcagc 660
tacctctccc aggtcctctc acttgccctgc cccgcgtcct ggttgcatgg ccgcacctgt 720
gtgtgtgcag aggtctgtgt cccatcctct gcacctcctt tccgggggcc tggggagccc 780
cacgtgttgc caagatcttg gtgcaataaa atactccggt tttgtgaaaa aaaaaaaaaa 840
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaa 875
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<210> 310

<211> 756

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (613)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (638)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (684)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (756)
 <223> n equals a,t,g, or c

<400> 310
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 cacgcgtccg ggcccgtggc gccgacagga tgggcaagtg tcgtggactt cgtactgcta 120
 ggaagctccg tagtcaccga cgagaccaga agtggcatga taaacagtat aagaaagctc 180
 atttgggcac agccctaaag gccaaccctt ttggagggtgc ttctcatgca aaaggaatcg 240
 tgctggaaaa agtaggagtt gaagccaaac agccaaattc tgccattagg aagtgtgtaa 300
 ggggccagct gatcaagaat ggcaagaaaa tcacagcctt tgtacccaat gacggttgct 360
 tgaactttat tgaggaaaaat gatgaagttc tgggttgctgg atttggtcgc aaaggtcatg 420
 ctggttggtga tattcctgga gtccgcttta aggttggtcaa agtagccaat gtttctcttt 480
 tggccctata caaaggcaag aaggaaagac caagatcata aatattaatg gtgaaaacac 540
 tgtagtaata aattttcata tgccaaaaaa aaaaaaaaaa aaaaaaaagg gsgggcscyc 600
 taaaagatcc tcnaagggcc aagcttacgc tgcatgcnac tctactctct cctatatgaa 660
 tctattataa ctagcctggc ctctttacac tctgatggaa ttctactgga ttttaagact 720
 atcttggttat atgacactct caaataacca gtattn 756

<210> 311
 <211> 851
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (834)
 <223> n equals a,t,g, or c

<400> 311
 ctattggtgt gaacagtgtg atgtacaatt ctccctcaagc agtgaactct acctacattt 60
 ccaggagcac agctgtgatg aacagtactt gtgtcagttc tgtgaacatg aaactaatga 120
 tccagaagac ttgcatagcc atgtggtaaa tgagcatgca tgtaaattaa tagagttaag 180
 tgataagtat aacaatggtg aacatggaca gtatagcctc ttaagcaaaa ttacctttga 240
 caaatgtaaa aacttctttg tatgtcaagt atgtggtttt cggagtagac ttcacacaaa 300
 tgttaacagg catgttgcta ttgaacatac aaaaattttt cctcatgttt gtgatgactg 360
 tgggaaaggc ttttcaagta tgctagaata ttgcaagcat ttaaattcac atttatctga 420

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agggatttat ttatgtcaat attgtgaata ttcaacagga caaattgaag atcttaaaat 480
tcattctagat ttcaagcatt cagctgactt gcctcataaa tgtagtgact gcttgatgag 540
gtttggaaat gaaagggaat taataagtca ccttccagtc catgagacaa cttgattatt 600
ctctttaact tacagaatgt tagtttaaaa taataaattc atcctttttt tggagatgat 660
taaatggatg attgtaaaca caacttatga aatctgcctt taacaagtaa cttttttaaa 720
ttataaaaatt ttattggcat tgctccattt tctgtatata aatataatctt taatgtggta 780
ttttcaaaaa aaaaaaaaaa aaaaaaatcc acgcggccgc gaattcccgg gtcnaacaag 840
ctcactaatc c 851
```

<210> 312

<211> 1335

<212> DNA

<213> Homo sapiens

<400> 312

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gaacctagcc agcaaaggag cggcggagtt cctcctcgtc gtcgtcgctc tctagctcct 120
cctcctcttc atcatcgctg tcgtcgctcct cctcctcctc tggtccagtc tctagtact 180
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ccccagcccc aaaggaggct gttcgagagg gacgtcctcc ggagccaacc ccagccaaac 300
ggaagaggcg ctctagcagt tccagttcca gctcctcctc ttcactctcc tcctcctcct 360
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cctcgtcgtc tcctccccct tccccctgta agcctggccc tcaggcttgc ccaaacctgc 480
aagccccaag aagccacccc ctggcgagcg gaggtcccgc agccccgga agccaataga 540
ctccctcagg gactctcggt ccctcagcta ctgcctgtg gagcgtcgcc gtccctcgcc 600
ccagccctca ccacgggacc agcagagcag cagcagttag cggggttccc ggagaggcca 660
gcgtggggac agccgctccc ccagccacaa gcgcaggagg gagacaccta gccctcggcc 720
catgagacac cgctcctcca ggtctccata aattgtcttt gggggattcc accacaccca 780
atgctctgga gccacaagga gtgtcccttc tccccagca gagccgtggg agggctcctt 840
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aaaaaaaaaa aaaaa 1335
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<210> 313

<211> 516

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (505)

<223> n equals a,t,g, or c

<400> 313

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```



```

ctgagggagg cgcgagggcg cggagttcca ggtcgagcag ttaggccgcg agcgactgcg 120
gcgccgagcc gatgagtaac ccgaagcccc tagaggagtg gtcacctgcc tgagggcact 180
tctgtcccac cagcatcaga ccaggccgca ccgagtcccc ggcaccatgt ttgggaagag 240
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cgaccagcac gagcagaagt tcacggggct gccccgccag tggcagagcc tgatcgasga 360
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ggcccccaag accatcgtgc ggggcagcaa argtgccaaa gatggggccc tcacgctgct 480
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```

<210> 314

<211> 1833

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (625)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1761)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1766)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1792)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1806)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1827)

<223> n equals a,t,g, or c

<400> 314

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tcgacccacg cgtccgcagc cgtcgcccga cgaggcgcca ccgctgcagg cgctgctgga 60
cggccgcggg ctctgctca acgctagtgc cgtcagccgc ctgcgcgcct acctgctgcc 120
agcgccgcca gctccaggaa atgctagtga gtcggaggaa gaccgcagcg ccggcagtgt 180
ggagagcccc tccgtctcca gcacgcaccg ggtgtctgat cccaagtccc accccctcca 240
ttcaaagata atcatcatca agaaaggcca tgctaaagac agccagcgct acaaagttga 300
ctacgagtct cagagcacag ataccagaa cttctcctcc gagtccaagc gggagacaga 360

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```

atatggtccc  tgccgtagag  aaatggaaga  cacactgaat  cacctgaagt  tcctcaatgt  420
gctgagtc  aggggtgtac  acattcccaa  ctgtgacaag  aagggatttt  ataagaaaaa  480
gcagtgtcgc  cttccaaag  gcaggaaagcg  gggcttctgc  tgggtgtgtgg  ataagtatgg  540
gcagcctctc  ccaggctaca  ccaccaaggg  gaaggaggac  gtgactgct  acagcatgca  600
gagcaagtag  acgcctgccg  caagnttaat  gtggagctca  aatatgcctt  attttgaca  660
aaagactgcc  aaggacatga  ccagcagctg  gctacagcct  cgatttatat  ttctgtttgt  720
ggtgaactga  ttttttttaa  accaaagttt  agaaagaggt  ttttgaaatg  cctatggttt  780
ctttgaatgg  taaacttgag  catcttttca  cttccagta  gtcagcaaag  agcagtttga  840
attttcttgt  cgcttcctat  caaaatattc  agagactcga  gcacagcacc  cagacttcat  900
gcgcccgtgg  aatgctcacc  acatgttggg  cgaagcgcc  gaccactgac  tttgtgactt  960
aggcggtgt  gttgcctatg  tagagaacac  gcttcacccc  cactccccgt  acagtgcgca  1020
caggctttat  cgagaatagg  aaaaccttta  aaccccggtc  atccggacat  cccaacgcat  1080
gctcctggag  ctcacagcct  tctgtggtgt  catttctgaa  acaaggcggt  ggatccctca  1140
accaagaaga  atgtttatgt  cttcaagtga  cctgtactgc  ttggggacta  ttggagaaaa  1200
taagggtggag  tcctacttgt  ttaaaaaata  tgtatctaag  aatgttctag  ggcactctgg  1260
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<210> 315

<211> 1354

<212> DNA

<213> Homo sapiens

<400> 315

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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaa 1354

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<210> 316

<211> 2421

<212> DNA

<213> Homo sapiens

<400> 316

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tgctttccat ccagtatgct a

2421

<210> 317

<211> 1092

<212> DNA

<213> Homo sapiens

<400> 317

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<210> 318

<211> 1380

<212> DNA

<213> Homo sapiens

<400> 318

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<210> 319

<211> 2612

<212> DNA

<213> Homo sapiens

<400> 319

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<210> 320

<211> 943

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (52)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (54)

<223> n equals a,t,g, or c

<400> 320

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<210> 321

<211> 2959

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2956)

<223> n equals a,t,g, or c

<400> 321

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atcttggttc acactagtca cattcttggt ttaagtgcct ttagttttaa cagttcactt 2820
tttacagtgc tatttactga agttatttat taaatatgcc taaaatactt aaatcggatg 2880
tcttgactct gatgtatttt awcagggttg gtgcatgaaa tttttataga taaagragtt 2940
gaggaaanaa aaaaanaaa                                2959

```

<210> 322

<211> 802

<212> DNA

<213> Homo sapiens

<400> 322

```

ggcacagctg gaggcgcggg agggcagcga gaggttcgcg ggtgcagcgc acaggagacc 60
atgtccgggg gcagcagctg cagccagacc ccaagccggg ccatccccgc cactcgccgg 120
gtggtgctcg gcgacggcgt gcagctcccg cccggggact acagcacgac ccccgccggc 180
acgctcttca gcaccacccc gggaggtacc aggatcatct atgaccggaa attcctgatg 240
gagtgtcggg actcacctgt gacaaaaaca cccccaaggg atctgccac cattccgggg 300
gtcaccagcc cttccagtga tgagccccc atggaagcca gccagagcca cctgcgcaat 360
agcccagaag ataagcgggc gggcgggtgaa gagtcacagt ttgagatgga catttaaagc 420
accagccatc gtgtggagca ctaccaaggg gcccctcagg gccttcctgg gaggagtccc 480
accagccagg ccttatgaaa gtgatcatc tgggcaggcg ttggcgtggg gtcggacacc 540
ccagcccttt ctccctcact cagggcacct gcccctcct cttcgtgaac accagcagat 600
acctccttgt gcctccactg atgcaggagc tgccacccca aggggagtga cccctgccag 660
cacaccctcg cwgcyygggg sgcaaccacc ccttccttag gttgatgtgc ttgggaaagc 720
tccttcccc tccttcccc aagagaggaa taaaagccmc cttcgcccta gggccaaraa 780
aaaaaaaaaa aaaaaaaaaa aa                                802

```

<210> 323

<211> 1724

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1590)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1650)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1701)

<223> n equals a,t,g, or c

<400> 323

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gcagcctgcc agccgcgctg ctgctgctcc tcctgctgtg ggaccgctga ccgcgcggct 60
gtccgctct ccccgctcca agcgcgcatc tgggcaccgc ccaccagcat ggacgctcgc 120
cgcgtgccgc agaaagatct cagagtaaag aagaacttaa agaaattcag atatgtgaa 180
ttgatttcca tggaaacctc gtcacacctc gatgacagtt gtgacagctt tgcttctgat 240

```



```

aattttgcaa acacgaggct gcagtcagtt cggaaggct gtaggacccg cagccagtgc 300
aggcactctg gacctctcag ggtggcgatg aagtttccag cgcgagtag caggggagca 360
accaacaaaa aagcagagtc ccgccagccc tcagagaatt ctgtgactga ttccaactcc 420
gattcagaag atgaaagtgg aatgaatttt ttggagaaaa gggctttaaa tataaagcaa 480
aacaagcaa tgcttgcaaa actcatgtct gaattagaaa gcttccctgg ctctgtccgt 540
ggaagacatc ccctcccagg ctccgactca caatcaagga gaccgcgaag gcgtacattc 600
ccgggtgttg cttccaggag aaaccctgaa cggagagctc gtccctcttac cagggtcaagg 660
tcccggatcc tcgggtccct tgacgtctta cccatggagg aggaggagga agaggataag 720
tacatgttgg tgagaaagag gaagaccgtg gatggctaca tgaatgaaga tgacctgcc 780
agaagccgtc gctccagatc atccgtgacc cttccgcata taattcgccc agtggagaa 840
attacagagg aggagtggga gaacgtctgc agcaattctc gagagaagat atataaccgt 900
tactgggct ctacttgta tcaatgccgt cagaagacta ttgataccaa aacaaactgc 960
agaaaccag actgctgggg cgctcgaggc cagttctgtg gccctgcct tcgaaaccgt 1020
tatgtgaag aggtcaggga tgctctgtg gatccgaact ggcattgcc gccttgctga 1080
ggaatctgca actgcagttt ctgccggcag cgagatggac ggtgtgcgac tggggtcctt 1140
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caggaatttg aaatgcaagc ataatatctg gaaaatttgc tgcctgcctt ctacttctca 1260
aatctttctt gtaaaagttt ccaatttttt cactgaaacc tgagttaaaa atcttgatga 1320
tcagcctgtt tcataagaaa ctccaatcaa gttaattcta gcagacatgt gtttctggag 1380
catcacagaa ggtatattgc tagttacact ttgccctcct gcagtttctt ctctgctccc 1440
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tgaatttctt ttaaattaca gttttatgaa agcatatttt atttacttgg tgttgaaata 1560
gccctyataa aacctaagca cttggaaacn caataatagt attaactaac tagatctatt 1620
gaatttcaga gaagagccta aatagcaaan ttacacaaa aacgagtatg atttagcact 1680
catactagtt gagggtttgg ngccgatagc gactgctaata gaac 1724

```

<210> 324

<211> 2261

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1098)

<223> n equals a,t,g, or c

<400> 324

```

cccagatggt agccaacag gggacgcttt tgcctcttt gcctgtgagg aatatgcaca 60
gaatgcgttg aggaagcata aagacttggt gggtaaaaga tacattgaac tcttcaggag 120
cacagcagct gaagttcagc aggtgctgaa tcgattctcc tcggccctc tcattccact 180
tccaaccctt cccattattc cagtactacc tcagcaattt gtgcccccta caaatgttag 240
agactgtata cgccttcgag gtcttcccta tgcagccaca attgaggaca tcctggattt 300
cctgggggag ttcgccacag atattcgtac tcatgggggt cacatgggtt tgaatcacca 360
gggccgcccc tcaggagatg cctttatcca gatgaagtct gcggacagag catttatggc 420
tgcacagaag tgcataaaa aaaacatgaa ggacagatat gttgaagtct ttcagtgttc 480
agctgaggag atgaactttg tgtaaatggg gggcacttta aatcgaaatg gcttatcccc 540
accgccatgc ctgtctctc cctcctacac atttccagct cctgctgcar ttattcctac 600
araarctgcc atttaccagc cctctgtgat tttgaatcca cgagcactgc agccctycac 660
agcgtactac ccagcaggca ctcagctctt catgaactac acagcgtact atcccagtgt 720
ttgaaagatg tatggtgatc ttgaaacctc cagacacaag aaaacttcta gcaaattcag 780
gggaagtttg tctacactca ggctgcagta ttttcagcaa acttgattgg acaaacgggc 840

```

```

ctgtgcctta tcttttggtg gagtgaaaaa atttgagcta gtgaagccaa atcgtaactt 900
acagcaagca gcatgcagca tacctggctc tttgctgatt gcaaataaggc atttaaaatg 960
tgaatttgga atcagatgtc tccattactt ccagttaaag tggcatcata ggtgtttcct 1020
aagttttaag tcttgataa aaactccacc agtgtctacc atctccacca tgaactctgt 1080
taaggaagct tcattttngt atattccgcg tcttttctct tcatttccct gtcttctgca 1140
taatcatgcc ttcttgctaa gtaattcaag cataagatct tggaataata aaatcacaat 1200
cttaggagaa agaataaaat tgttattttt ccagctctct ggccatgatg atatcttatg 1260
attaaaaaca aattaaatth taaaacacct gaagatawat tagaagaaat tgtgcaccct 1320
ccacaaaaca tacaaagttt aaaagtttgg atcttttctc cagcaggatc cagttgtaaa 1380
taatgaatta ggggccaaaa tgcaaaacga aaaatgaagc agctacatgt agttagtaat 1440
ttctagtttg aactgtaatt gaattattgt gcttcataatg tattatttta tattgtactt 1500
ttttcattat tgatggtttg gactttaata agagaaattc catagttttt aatatcccag 1560
aagtgaagca atttgaacag tgtattctag aaaacaatac actaactgaa cagaagttaa 1620
tgcttatata tattatgata gccttaaacc tttttcctct aatgccttaa ctgtcaaata 1680
attataacct tttaaagcat aggactatag tcagcatgct agactgagag gtaaactactg 1740
atgcaattag aacagggtact gatgctgtca gtgtttaaca ctatgttttag ctgtgtttat 1800
gctataaaag tgcaatatta gacactagct agtactgctg cctcatgtaa ctccaaagaa 1860
aacaggattt cattaagtgc attgaatgtg gmtatttctc taagttaactc atattgtcct 1920
ttgcttgaat gcaatgccgt gcagatttat gwggctgcta tttttatttt ctgtgcatta 1980
ctttaacacc ttaaaggag aagcaaacat ttccttcttc agctgactgg caatggccct 2040
ttaactgcaa taggaagaaa aaaaaaaagg tttgtgtgaa aattgggtgat aactggcact 2100
taagatcgaa aagaaatttc tgtatacttg atgccttaag atgcccagaag ctgcccagaag 2160
ctctgaaaga cttaagata ggcagtaatg cttactacaa tactactgag tttttgtaga 2220
gttaacattt gataataaaa cttgcctgtt taatctcaaa a 2261

```

<210> 325

<211> 1213

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1213)

<223> n equals a,t,g, or c

<400> 325

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tggacgcgtg ggtcgaccca cgcgtccggt caaaaytaac cccctaataa aattaattaa 60
ccactcattc atcgacctcc ccaccccatc caacatctcc gcatgatgaa acttcggctc 120
actccttggc gcctgcctga tcttccaaat caccacagga ctattcctag ccatgcacta 180
ctcaccagac gcctcaaccg ctttttcttc aatcgccac atcactcgag acgtaaatta 240
tggttgaatc atccgtctacc ttcacgcaa tggcgctca atattcttta tctgcctctt 300
cctacacatc gggcgaggcc tatattacgg atcatttctc tactcagaaa cctgaaacat 360
cggcattatc ctctgcttg caactatagc aacagccttc ataggctatg tctctccgtg 420
aggccaaata tcattctgag gggccacagt aattacaaac ttactatccg ccatcccata 480
cattgggaca gacctagttc aatgaatctg aggaggctac tcagtagaca gtcccaccct 540
cacacgattc tttaccttct acttcatctt gcccttcatt attgcagccc tagcagcact 600
ccacctccta ttcttgacag aaacgggatc aaacaacccc ctaggaatca cctcccatc 660
cgataaaatc acctccacc cttactacac aatcaaagac gccctcggtt tacttctctt 720
ccttctctcc ttaatgacat taacactatt ctcaccagac ctctaggcg acccagacaa 780
ttatacccta gccaacccct taaacacccc tccccacatc aagcccgaat gatatttctt 840
attgccttac acaattctcc gatccgtccc taacaaacta ggagggctcc ttgcctatt 900

```

```

actatccatc ctcatcctag caataatccc catcctccat atatccaaac aacaaagcat 960
aatatttcgc ccactaagcc aatcacttta ttgactccta gccgcagacc tcctcattct 1020
aacctgaatc ggaggacaac cagtaagcta ccctttttacc atcattggac aagtagcatc 1080
cgtactatac ttcacaacaa tcctaatacct aataccaact atctccctaa tkgaaaacaa 1140
aatactcaaa tgggcctaaa aaaaaaaaaa aaaaacycgg gggggggccg ggtwcccaat 1200
ttcccccta ggn 1213

```

<210> 326

<211> 2764

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (372)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2128)

<223> n equals a,t,g, or c

<400> 326

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gccggagcaa ggctgagctg ctccgcagca tcgccaagag gaaggagcgc ctggccatcc 60
tggaacagtc ggctgggcag atccgggctc aggccgkca rgartcagaa cgccctggccc 120
gggacaagaa tgcctcctta cagctgctgc aaaaggagaa ggagaagctg actgtgctgg 180
aaaggagata ccactcactc acagggggca ggcctttccc gaagaccaca tcgaccctca 240
aagaggttta ccgctccaag atggatggcg aggccaccag ccccttccc cggaccgcga 300
gcggcccctc cctcctcct ctggctcttc ctccctctcc tcccagctca gcgtggctac 360
cctggggcgt ancycckccc caaagagcgc tctactcacc cagaatggca cgggcagcct 420
tcctcgcaac ctggcagcca cactgcagga catcgagacc aagcgccaac tagctctgca 480
gcagaagga caacaagtga ttgaagagca gcggcggcga ctggctgagc tgaagcagaa 540
agcggcagtg aggcacagtg ccagtgggat gcccttcacg gggcagcacc cttcccagcg 600
ggccccctcg gcttcccccc tctcatgcac cactctatcc tacaccacct gcctgcgggg 660
cgggagcgtg gggaggaggg tgagcacgcc tatgatacgc tgagtctgga gagctctgac 720
agcatggaga ccagcatctc caccgggggc aactcggtg ctcccctgac aacatgtcca 780
gcgcgagtg tctggacatg gggaagatcg aggagatgga gaagatgctg aaagaggctc 840
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ccctggagga ggagcggcgg aggcgkaca ggtagaacgg aggctgcaga gtgagagtgc 960
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cttcgaccgg ctcaagcgca ccctttccta ttatgtggac aagcatgaga cgaagctgaa 1260
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gccaaaga gaaggggttccg cttccactat ggtgactgag aagcccgaac ccagccctca 1380
ccttctgctg aaagaccat gaccggctgt aytacatggt ggccccatct gcagaggcca 1440
tgcgatctg gatggatgct attgtcacag gggctgaggg ctacactcag ttcatgaact 1500
aactgccgtg ggcctcctgg cagagcacaa ctggggcttt tgtataagaa gactttaata 1560
ttctgtaagg agcttggtcc tgtgagttc tgggctctgg cctcctgaag aaccagccag 1620
aagaagaaaa gtagaggtag ctttgctgcc tcctgggagc ccagaacttg cagtaaccct 1680

```

ttaggtcctg cccagggccc agccaggggt gaggagctgt cacagagagg gcctcagctc 1740
tgacctgaca cctgctctcc ccagcctggt ttctcttttc taaaagacaa attatggtac 1800
cataagctgc caaagatccc ctctgcctc agaccccttt gccaggggct ttgggggctg 1860
agcagagcca catccagagt ggggtaatag cttagggcggc ccgcttccca tttctcaaac 1920
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atggttacca tagtgactgc ttcattgcc a tggttacata ctaattgctg cagctctgtg 2100
gcccagccca ctgcttcagc tgtgggcnat ctgaggggtac gtgccatcat ctctccagcc 2160
cagggccctg ggcattctcat gctgggggga agggactgaa tacctttttc cttccccctg 2220
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gtttccgaca gggaaagagg attcctccaa tgctcctaga gagaaagcct gaggcaggaga 2460
tgatgcagca gaggggaagg gccctgtggt gccgccgcc ttccttcagc ctccgaagg 2520
tgatggaaat ggagagtggg ggaccaggcc tccagctgtc tggcctcgcc cttcacgcct 2580
taacactaag cccacctccc ctgctctcct tcccagcatt gagcccttgg ttgcctgggc 2640
ccaggctggg gggttttcagt atttgtaagc atttcagcag aacaataaag cctttggact 2700
acgraaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaggag 2760
gggc 2764

<210> 327

<211> 1764

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1398)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1758)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1759)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1762)

<223> n equals a,t,g, or c

<400> 327

ggacatcaaa gatgaggagc ctggagactt tgggccgacc gaagcctgaa tgtgaggggtt 60
acgaccccaa cgccctgtat tgcatttgcc gccagcctca caacaacagg tttatgattt 120
gctgtgaccg ctgtgaagaa tggtttcatg gcgatttgtt gggcatttct gaggctcgag 180
ggaggctttt ggaaaggaat ggggaagact atatctgccc aaactgcacc attctgcaag 240
tgcaggatga gactcattca gaaacggcag atcagcagga agctaaatgg agacctggag 300

```

atgctgatgg caccgattgt acaagtatag gaacaataga gcagaagtct agcgaagacc 360
aagggataaa gggtagaatt gagaaagctg caaatccaag tggcaagaag aaactcaaga 420
tcttccagcc tgtgatagag gcgcctgggt cctcaaaatg tattggcccc ggggtgctgtc 480
acgtggcgca cccgactcgg tgtactgcag taatgactgt atcctcaaac acgccgcagc 540
gacaatgaag tttctaagct caggtaaaga acagaagcca aagcctaaag aaaagatgaa 600
gatgaagcca gagaagccca gtcttccgaa atgcgggtgt caggcaggta ttaaaatctc 660
ttctgtgcac aagagaccag ctccagaaaa aaaagagacc acagtgaaga aggcagtggg 720
ggtcctctgc cggagtgaag cactcgggaa ggaagcagct tgtgagagca gcacgccgtc 780
gtgggcgagc gatcacaatt acaatgcagt aaagccagaa aagactgctg ctccctcgcc 840
gtcactgttg tataaatgta tgatcacct aggggttggc ctctggacc cctcccgctc 900
tttctggata gccatcccc tggcctgtcc aggactggga gttgcagctt tgtgttaagc 960
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aaacctcact ggtgaacggt caccttaatg attgattctt taatctctgt tttcactctc 1140
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ggcacgccac atccacccct gtctgcacat gagttgttct gacaacagcg ctgtatacgc 1260
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ggcagatagg ggattttntt ttttccatgt ccgattcaca cgctacacac ccacatgaac 1440
acattcgaac ttcgaaggcc acacactcct gcttcatagg cccacaggta agtgagttca 1500
cacctagaac actgtcctga ccgcaggacg cgtgccttgg acttggtatt ctacatgtga 1560
ctggctttct tgcctctgct tcttgaatgt ttagactctt aagatcatat cctgccccaa 1620
atttcaaatt aatgaaatga agatatttca aacagatctt tgaaacctca gattctgtgg 1680
tgcaatttta atgttttctt gtttctcagt tttctgctat aaaactattt tcaattcagt 1740
ctttaaaaaa aaaaaaannt cnaa 1764

```

<210> 328

<211> 571

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (7)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (535)

<223> n equals a,t,g, or c

<400> 328

```

gccaantac tttccagccc agtaaggggt atttcaggag agcagtcac tkaaggttct 60
ttccctttaa gatatgtgca ggatcaagtt gcggcacctt ttcagctgag taaccacact 120
ggccgcatca aggtggtctt tactccgagc atctgtaaag tgacctgcac caagggcagc 180
tgtcagaaca gctgtgagaa ggggaacacc accactctca ttagtgagaa tgggtcatgt 240
gccgacacc tgcagggcac gaacttccga gtggtaattt gccatcttcc atgtatgaat 300
gggtggccagt gcagttcaag ggacaaatgt cagtgccttc caaatttcac aggaaaactt 360
tgtcagatcc cagtccatgg tgccagcgtg cstaaacttt atcagcattc ccagcagcca 420
ggcaaggcat tggggacgca tgtcatccat tcaacacata ccttgccctc gaccgtgact 480
agccagcagg agtcaaagtg aaatttcttc cttaacatag tcaatatcca tgtgnaacat 540

```

cctcctgaag cttccgtcca gatacatcag g

571

<210> 329

<211> 473

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (37)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (449)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (467)

<223> n equals a,t,g, or c

<400> 329

```
cacgtagtaa tcttttaaata taaatagcca cgtgtgnact actatcatat gggacagaac 60
agttccagac cacattattg ataagatgtg ttaaaataaa taagatcttt ctgtgaactt 120
ttgggaacca aatgggtttt ggcatgattt ccagctcat tatatattga cacagaattt 180
tttcagaatg gcatttacta gtaccccaga aatttagcaa agtatagtta ggtacttatt 240
gtaaaatata ttgcatattt gatttaaggt ttgttatgaa cacactaatc tgatatttta 300
tattttaaacc attttcaatk ctgtaagact cagtaagagc tatttaatta tactgwaaca 360
aagaaaatct ataaataaat agcacaaata ggcacatgcg ggtgtataat actgaagtgg 420
tagtttttaa tttccgaaga gaataagcnt ttcaggccca ttagaancac aga 473
```

<210> 330

<211> 1335

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (865)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1004)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1156)

<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1301)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1328)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1333)
<223> n equals a,t,g, or c

<400> 330
ggcgctactg aggccgcgga ccggactgcg gttggggcgg gaagagccgg ggccgtggct 60
gacatggagc agccctgctg ctgaggccgc gccctccccg ccctgagggtg ggggcccacc 120
aggatgagca agctgcccag ggagctgacc cgagacttgg agcgcagctg cctgccgtgg 180
cctccctggg ctctcactg tcccacagcc agagcctctc ctgcacctc ctccgcgcgc 240
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tttgcacntt gntg 1335

<210> 331
<211> 1046
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (982)
<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (997)

<223> n equals a,t,g, or c

<400> 331

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tcgacatcaa aagcctctct cctgccagtg ccataggttt gttagagcta ctgttttgta 180
acagctgctc aggtgtcccc aaactccttg agttttccac cctgagctgt taaaaacctg 240
ccctgcctgt caccatttc tgtgccacca gcccaccccc tgccccaact ctctccctg 300
ccaccttctg tccctgccat aggaatatgg ggacaccgtg tacaccattg aagttccctt 360
tcacggcaag acgtttatcc tgaagacctt cctgccctgt cctgcggagc tcgtgtacca 420
ggaggtgac ctgcagcccc agaggatggt gctgtggaac aagacagtga ctgcctgcca 480
gatcctgcag cgagtgaag acaacaccct catctcctat gacgtgtctg caggggctgc 540
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ccgatacttg tcatcagga tcgccacctc acacagtgc aagccccga cgcacaaata 660
tgtccgggga gagaatggc ctgggggctt catcgtgctc aagtcggcca gtaacccccg 720
tgtttgcacc tttgtctgga ttcttaatac agatctcaag ggccgcctgc cccggtacct 780
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tcgccaccac ttccagagcc agaaagggtg ccagttgggc tcgcactgcc cacatgggac 960
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gstttgggtg gacattggat tcgggg 1046
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<210> 332

<211> 1311

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1280)

<223> n equals a,t,g, or c

<400> 332

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agcagccag aaattttatg aataagcatc agaagccagt gctaacaggc cagcggttca 180
aaactcggaa aagggatgaa aaagagaaat tcgaaccac agtcttcagg gatacacttg 240
tccaggggct taatgaggct ggtgatgacc ttgaagctgt agccaaattt ctggactcta 300
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gcagtatgct tgcccctgga ggaacgcgca tagatgatgg tgacaagacc aagatgacca 420
accactgtgt gttttcagca aatgaagatc atgaaacat ccgaaactat gctcagggtc 480
tcaataaaact catcaggaga tataagtatt tggagaaggc atttgaagat gaaatgaaaa 540
agcttctcct ctctcttaaa gccttttccg aaacagagca gacaaagttg gcgatgctgt 600
cggggattct gctgggcaat ggcaccctgc ccgccaccat cctcaccagt ctcttcaccg 660
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ggaaggaact gcagaaggag ctccaggagc gtctttctca ggaatgcccg atcaaggagg 960
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<210> 333

<211> 1444

<212> DNA

<213> Homo sapiens

<400> 333

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ccacaggccc cttccccagc ctcagttcac agctgccctg ttgcaggag gcggtggccc 180
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ccaacgccgc ccgacaacat ccaagtgcag gaaaacttca atatctctcg gatctatggg 360
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atgacagtga gcacgctggg gctgggagag ggcgctacag aggcggagat cagcatgacc 480
agcactcgtt ggcggaaagg tgtctgtgag gagacgtctg gagcttatga gaaaacagat 540
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caggacttca gagtgtgtgc ccagggtgtg ggcacccctg aggactccat cttcaccatg 780
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aacgggaaca agttctactc agagaaggag tgacagagag actgcgggtg ccctgggtgat 1260
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tggccagtgt ctgtcccggg gtcctgtggc aggcagcgcc aagcaacctg ggtccaaata 1380
aaaactaaat tgtaaaactcc tgaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1440
aagg 1444
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<210> 334

<211> 1030

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (59)

<223> n equals a,t,g, or c

<220>

<221> misc feature
<222> (989)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1006)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1023)
<223> n equals a,t,g, or c

<400> 334
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gctgtcctga ccacaccac tccttgctgc agcctgkag tcttccactt tcgccttggt 180
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ggggaccgca agcaaaagaa gagagaccag aacaagtcgg cggytytgag gtaccgccag 960
cggaaggggg caggaggggt tgagggcynk gggaagggga agttgncagg gggttgggaa 1020
ggnaagggaa 1030

<210> 335
<211> 2127
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (72)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2098)
<223> n equals a,t,g, or c

<220>
<221> misc feature

<222> (2114)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2117)

<223> n equals a,t,g, or c

<400> 335

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gaactgcaca gagacctcgc agccccgaga actgtcgccc ttccacgatg tggctcctgt 180
cctttatcct ggccactctc tctgcttccg cggcttgggc agggcatccg tcctcgccac 240
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cacagcctgt ggccattttc ctgggaatcc cttttgccaa gccgcctctt ggacccttga 360
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ctcctatgtg cacccaagat cccaaggcgg ggcagttact ctgagagcta ttacaaaacc 480
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acattgccag ctttgagggg aaccaggct ctgtgacct ctttgagag tcagcgggag 840
gagaaagtgt ctctgttctt gttttgtctc cattggccaa gaacctctc caccgggcca 900
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ggtggtgggg ggcaggggac agaggccatg aaggagcaag ttttgtattt gtgacctcag 2040
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<210> 336

<211> 847

<212> DNA

<213> Homo sapiens

<220>
 <221> misc feature
 <222> (291)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (334)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (829)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (847)
 <223> n equals a,t,g, or c

<400> 336
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 cccctcgcac gtctttccct tgcgcacctc ccagtcatag acccgggcgt gaccttcagg 240
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 cccctcgcgg accgcgtgaa cgtgacggta cggccgggcc tggccatggc gctgagcggg 420
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 caggaccgga tacttatccg ctttttcccc ttggagtccct ggcagattgg caagataggg 600
 acggtcatga cttttttatg attgggcacg gagggatcca gggcatctgt gaactggctg 660
 cttcttcag agagatctct tggcagagtg agggcctgga gataaccagc tttggattat 720
 cccgcataca acattcctgt gatcacataa tcctcttctt catcctcata tgaaataaat 780
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 ttggccn 847

<210> 337
 <211> 702
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (21)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (150)
 <223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (669)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (679)
<223> n equals a,t,g, or c

<400> 337
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ccgcctcttc cgctgcgtgc cggaccatgg cgcaggggca gcgcaagtgt caggcgccaca 120
aaccgcgaaa gagtaagacg gcagcggcan cctctgaaaa gaatcggggc ccaagaaaag 180
gcggctcgtgt tatcgtccc argaaggcgc gcgtcgtgca gcagcaaaaag ctcaagaaga 240
acctagaagt cggaatccgg aagaagatcg aacatgacgt ggtgatgaaa gccagcagca 300
gcctgcccga gaagctggca ctgctgaagg cccagccaa gaagaaagg gtagctgccg 360
ccacctctc caagacacct tctgaggac gctggcccca gtgcaggcca acatcccacc 420
ccctacctc atatgggacc ttgcaagtca tcccacaggc tgcactgtca ggaagaggac 480
cctgtccccc agcactgggc ttcacctaga acttcagtgg gggccaagg tgctgagaac 540
ccagcaatga ccaggaagat acagtcacta acttcacttg tccccgtgcc ccttcccagg 600
tctgcctcc acaggtttta cccagaacaa taaacctggc tttgtcaama aaaaaaaaaa 660
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<210> 338
<211> 875
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (791)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (813)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (830)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (861)
<223> n equals a,t,g, or c

<400> 338

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cacacacaaa gataacagta cctagagaga gagtgtgtgt gagtgtgcgt gtctctgtgt 180
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tatattttta ttagaactca ttattctggg taccctccaa tgagaattag agaggttaaa 600
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<210> 339

<211> 1448

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1427)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1432)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1440)

<223> n equals a,t,g, or c

<400> 339

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tgctgatggg actatatgct acgactccac ccactacaag gagacttggg aggcctctgga 780
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gagagtccca agggatgcag ggcatcctct gtaccccttt aatgaccctg actgagacca 1320
cagcttcttg gcctcccttc cagctctgca gctaattgagg tcctgccaca acggaaagag 1380
ggagttaata aagccattgg agcatccaaa aaaaaaaaaa aaaaaanayc tngsggccgn 1440
caaggga 1448

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<210> 340

<211> 843

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (812)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (822)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (829)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (838)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (841)

<223> n equals a,t,g, or c

<400> 340

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gctgatctcc tgccatgatg ttctgtctca gagccaaggc caagaggccc agacagagtt 180
gccccaggcc cggatcagct gccagaagg caccaatgcc tatcgctcct actgctacta 240
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gggcaacctg gtgtctgtgc tcaccaggc cgagggtgcc tttgtggcct cactgattaa 360
ggagagtggc actgatgact tcaatgtctg gattggcctc catgaccca aaaagaaccg 420
ccgctggcac tggagcagtg ggtccctggt ctctacaag tcctggggca ttggagcccc 480

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```
aagcagtgtt aatcctggct actgtgtgag cctgacctca agcacaggat tccagaaatg 540
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gctggaaaat acatgtctag aactgatcca gcaattacaa cggagtcaaa aattaaaccg 660
gaccatctct ccaactcaac tcaacctgga cactctcttc tctgctgagt ttgccttggt 720
aatcttcaat agttttacct accccagtct ttggaaccyt aaataataaa aataaacatg 780
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naa 843
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<210> 341

<211> 1293

<212> DNA

<213> Homo sapiens

<400> 341

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acggatatcc tctgttgggg gagaagcaac attttgtgat tttccaaaaa taaaccatgg 180
aattctatat gatgaagaaa aatataagcc attttcccag gttcctacag gggaagtttt 240
ctattactcc tgtgaatata attttgtgtc tccttcaaaa tcattttgga ctgcataaac 300
atgcacagaa gaaggatggt caccaacacc aaagtgtctc agactgtgtt tctttccttt 360
tgtggaaaat ggtcattctg aatcttcagg acaaacacat ctggaagggtg atactgtgca 420
aattatttgc aacacaggat acagacttca aaacaatgag aacaacattt catgtgtaga 480
acggggctgg tccacccctc ccaaatgcag gtccactgac acttcctgtg tgaatccgcc 540
cacagtacaa aatgctyata tastgtcgag acagatgagt aaatatccat ctggtgagag 600
agtacgttat saatgtagga gcccttatga aatgtttggg gatgaagaag tgatgtgttt 660
aaatggaaac tggacrgaac cacctcaatg caaagattct acrggaaaaat gtggggccccc 720
tccacctatt gacaatgggg acattacttc attcccgttg tcagtatatg ctccagcttc 780
atcagttgag taccaatgcc agaacttgta tcaacttgag ggtaacaagc gaataacatg 840
tagaaatgga caatggtcag aaccaccaa atgcttacat ccgtgtgtaa tatcccgaga 900
aattatggaa aattataaca tagcattaag gtggacagcc aaacagaagc tttattygag 960
aacagggtgaa tcagytgaa ttgtgtgtaa acggggatat cgtctttcat cacgttctca 1020
cacattgcga acaacatgtt gggatgggaa actggagtat ccaacttgtg caaaaagata 1080
gaatcaatca taaartgcac acctttattc agaactttag tattaaatca gttctyaatt 1140
tcatttttwa tgtattgttt tactcctttt tattcatagc taaaattttg gattaatttg 1200
tgaaaatgta attataagct gagaccgggt gctctcttct taaaagcacc atattaaatc 1260
ctggaaaact aaaaaaaaaa aaaaaaaact cgc 1293
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<210> 342

<211> 1273

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (6)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (483)

<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1247)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1262)
<223> n equals a,t,g, or c

<400> 342
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aggaggaaga aaggaggaggc acaaaggccg ggccgaggcag tatacaagcc ctgaggagat 120
cgacgcgcag ctgcaggctg agaagcagaa ggccaggga gaagaggagc aaaaagaagg 180
tggagatggg gctgcaggctg accccaaaaa ggagaagaaa tctctagact cagatgagag 240
tgaggatgaa gaagatgact accagcaaaa gcgcaaaggc gttgaagggc tcatcgacat 300
cgagaacccc aaccgggttg cacagacaac caaaaaggtc acacaactgg atctggacgg 360
gccaaaggag ctttcgagga gagaacgaga agagattgag aagcagaagg caaaagagcg 420
ttacatgaaa atgcacttg ccgggaagac agagcaagcc aaggctgacc tggcccggct 480
ggncatcatc cggaaacagc gggaggaggc tgcccggaa aaggaagagg aaaggaaagc 540
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gcgaccctg ggaggagatg ccggggacct gggccgcgct gccaggacct ctgctgtgtc 660
tcgcccaccc tgtgcccttg cgccgctgca acagcccctc atggccagga gccccccatg 720
gcctggggcc tcctcttcat cttggcacag aaattgtttg ggggatgggg ggggggactg 780
ggggaggggt agctgctatc tttgagacag aaagrkyag aagagctttc atttgtctgg 840
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cacacagccc cgactgtgt tgccctgggtg ctcatcaga gaggggctat catctgggag 960
cctgtgcccc tgggtcctcg agggcatggt cttgtccctg gtcagtcctg tctgactgac 1020
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tgcccatttt cagccctacc cattgatcat ttcaagaaac ctctgtttac tgtgtggcac 1140
ccaggcaaaa catgctccac aaattcaact tgtatatattg gcagattaaa cttgacatta 1200
tcgtaaaaaa aaaaaaaaaa atttgggggg gggcccggta cccattnggg cccttagggg 1260
gnggtttaa tta 1273

<210> 343
<211> 1793
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1251)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1267)
<223> n equals a,t,g, or c

<400> 343

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gactacagcg atgatgggtg ggtgaatttg aaccggcaag gcttcagcta ccagtgctcc 180
caggggcagg tgatagtggc cgtgaggagc atcttcagca agaaggaagg ttctgacaga 240
caatggaact acgcctgcat gcccacrcca cagagcctcg gggaacccac ggagtgtctg 300
tgggaggaga tcaacagggc tggcatggaa tggtagcaga cgtgctccaa caatgggctg 360
gtggcaggat tccagagccg ctacttcgag tcagtgtctg atcgggagtg gcagttttac 420
tgttgtcgct acagcaagag gtgcccatac tcctgctggc taacaacaga atatccaggt 480
cactatgggt aggaaatgga catgatttcc tacaattatg attactatat ccgaggagca 540
acaaccactt tctctgcagt ggaaagggat cgccagtggg agttcataat gtgccggatg 600
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aggaaagggg ccaggggaca ggagggtgtc cacatatgtt aacatcagtt ggatctccta 720
tagaagtttc tgetgtcttc ttcccttctc cctgagctgg taactgcaat gccaaacttc 780
tgggcctttc tgactagtat cacacttcta ataaaatcca caattaaacc atgtttctca 840
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tgaaatgggg aaatggaagg gtttgaggc agagctgaaa acaggggttg naagggattt 1260
cctgaantta raagacaaac gttagcatat ccagtaagga aaatgagtgc aggggccagg 1320
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gaatgggatt cagattggga acttgtgggg atgagagtga ccaggttgaa ctgggaagtg 1440
gaaaaaggag tttgagtcac tggcacctag aagcctgccc acgattccta ggaaggctg 1500
cagacaccct ggaacccctg ggagctactg gcaaaactct ctggattggg cctgattttt 1560
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ctgcagagat ggcgctatct ttccctctcc tgtgatgtcc tgctcccaac catttgtact 1680
cttcattaca aaagaaataa aaatatatac gttcamwawg ctgaaaaaaaa aaaaaaaaaa 1740
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 1793
```

<210> 344

<211> 1672

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (95)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1667)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1668)

<223> n equals a,t,g, or c

<400> 344

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aagtctaagc gccggaagtg gtgggcattc tgggtaacga gctatctact tcctgcgggt 180
gcacaggctg tggctcgtct tctccctgtt gttcttccca tcggcgaaga tggccctgga 240
gacggtgccg aaggacctgc ggcatctgcg ggctgtttg ctgtgttcgc tggtaagac 300
tatagaccag tttgaatatg atggttgtga caattgtgat gcatactac aaatgaaggg 360
taaccgagag atggtatatg actgcactag ctcttccttt gatggaatca ttgcgatgat 420
gagtccagag gacagctggg tctccaagtg gcagcgagtc agtaacttta agccagggtg 480
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aggagtggcc taaaaatcca gagacacagc tataaagacc tagcaagatg caaggctgcc 600
agcatctttg ctctccacct cctgcctctg cttatttctt gttctggaac taaatgaaca 660
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ggattaacag atggaattga ggagagagta ggatgctgat ttctctaccc gtggcccagg 840
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tccccatttt gatttcccta agttccttgt tctccctcta aaaagagaat gattgcacc 1560
tgctgtttta cctcaggatt gttgtgattg tagaaacgaa gctatgtgaa aattatataa 1620
gtattataaa ggtgaaatac tttgtctctc aaaaaaaaaa aaaaaanntt aa 1672

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<210> 345

<211> 2109

<212> DNA

<213> Homo sapiens

<400> 345

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caagacaccc cagaggatct tcagcagtc tacttcccat tctctataga gctttgaagc 180
ttggaaccct tccagggtaa acattttctc ttgtgctgct yaggacatyt ggggcctagc 240
tcctgggttc ctgtctccaa gaagcaatga cctaaactc tgagccatac tctgtcctca 300
ccagcggctc ccattgtttt ctgtgtcagg ttattaagta cctagtcctt gttttctgtc 360
tctstcctaa gctacctctc tgggtccaca gaagacttgg tagtatagtg agaattgcta 420
tacgtgagta caaacrtgga ttttccaagg gcttggaam tgattcttga gccagaaga 480
gccamgcctg ctttgaggte ttttgagtg gagatgcagc cctgggaaat ttggggagtc 540
agcaggccag tgtgaagcwa ttggtcctag gagtatatga gcttgctgtt tctttgatgg 600
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atctatccaa cttctttact gagtgatgta ttccatgggg ttaccttttt cagattattg 720
agttgctctg taagcactaa aactttttta tcatttttaa gaaacttttt agattgtatt 780
acaaatttgc cttaacagta attagatgtt gaatataatt ttaacatttt attaatgact 840
tgggtcatca gttaatacca gtactaaaac catacgaatt attggtttat tccagaaaat 900

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aattaatttg attgcatgaa ctaagcaatt ttactaatga aaagggtgta tatgtgcaag 1080
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attcattctt aagctttaac ttgaaggat cgtaattgcc ggcatttgat gtttagcaat 2040
aaaagaataa atgtgtacca gcattttatg tttaaaaaaa aaaaaaaaaa actcgagact 2100
agtctctct 2109

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<210> 346

<211> 1714

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (21)

<223> n equals a,t,g, or c

<400> 346

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ggtagctgtat attttcatct aatggagaac tagctgtact ttgaataagg attgctgcac 180
tgtagcactt tagaacatcc ctcaaatgt cgtaacccg gagccagaac cccacggcc 240
tgaagcagat tggcctggac cagatctggg acgacctcag agccggcatc cagcaggtgt 300
acacacggca gagcatggcc aagtccagat atatggagct ctacactcat gtttataact 360
actgtactag tgttcaccag tcaaaccaag cacgaggagc tggagttcct ctttctaagt 420
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gacgaaaagg aatatatgaa atctattcgc ttgcattggg gacttgagaa gactgtctgt 720
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atggtgaaac catcaatata agattgatta gtggagttgt acagtcttac gtggaattgg 840
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tgcagcagaa cccagttact gaatatatga aaaaggcaga ggctcgtctg cttgaggaac 1020
aacgaagagt tcaggtttac cttcatgaaa gcacacaaga tgaattagca aggaaatgtg 1080

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```

aacaagtcct cattgaaaaa cacttggaag ttttccacac agaatttcag aatttattgg 1140
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gcctaggaga attgaaaaaa ctggttgaga cacacattca taatcagggt cttgcagcca 1260
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tcttcaagta catagaagac aaagacgtat ttcagaagtt ctatgcgaag atgctcgcca 1620
agaggctcgt ccaccagaac agtgcaagtg acgatgccga agccagcatg atctccaagt 1680
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<210> 347

<211> 1672

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1667)

<223> n equals a,t,g, or c

<400> 347

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agtcaattct tgaaaatgtg gatacaccag aattgctttg caaatgtgtt aagtgcattc 480
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 <213> Homo sapiens

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 <211> 1842
 <212> DNA
 <213> Homo sapiens

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<222> (1307)

<223> n equals a,t,g, or c

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<223> n equals a,t,g, or c

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<222> (2540)
<223> n equals a,t,g, or c

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<212> DNA

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<222> (771)

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ccctgcgggg agtcggcccc cgaccttgcc ggcttcaccc tcctaatagcc agcagtatct 180
gttggaatg ttggccagct tgcaatggat ctgattattt ctacactgaa tatgtctaag 240
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gaaaaagcc ggtgcattcc tgaaatagat gattccgagt tttgtatccg cattccggga 660
ggaggatatca caaaaacact ctatgatgaa agctgttcta aagaaatcca aatggcagtt 720
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taaacattct atacaaaaaa attgtatgat ctgggtattag gaaattactt tcacagtaaa 1020
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aaattttgta cctcggccgc gaccacgcta agccgaatt 1119
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<210> 355

<211> 738

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (654)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (689)

<223> n equals a,t,g, or c

<400> 355

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cggaatttca tcaatttgaa tgaattcaca acctatggca gcgargaaag caccaaaccc 120
gcctccgtcc gggccctgct gtttgamatc tccttctca tgctgtgcca tgtggcccag 180
```

```

acctatggtt caragggtgat tctgtccgag tcgcgcacag gagctgaggt gcccttcttc 240
gagacctgga tgcagacctg catgcctgag gagggcaaga tcctgaaccc tgaccacccc 300
tgcttccgcc ccgactccac caaagtggag tccctggtgg ccctgctcaa caactcctcg 360
gagatgaagc tagtgacgat gaagtggcat gaggcctgtc tcagcatctc agccgccatc 420
ttggaaatcc tcaatgcctg ggagaatggg gtcctggcct tcgagtccat ccagaaaatc 480
actgataaca tcaaagggaa ggtatgcagt ctggcggtgt gtgctgtggc ttggcttgtg 540
gcccacgtcc ggatgctggg gctggatgag cgtgagaagt cgctgcagat gatccgccag 600
ctggcagggc cactgttttag ygagaacacc ctgcagttct acaatgagag ggtngtgatc 660
atgaactcga tcctgggagc gcatgtgtnc cgacgtgctg cagcagacag ccacgcagga 720
ttcaagtttc cctccaac                                     738

```

<210> 356

<211> 1966

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (56)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (788)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1753)

<223> n equals a,t,g, or c

<400> 356

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acgcttcagt tctgctctgc aaggatatat aataactgat tgggtgtgcc gtttaataaaa 180
agaatatgga aactgaacag ccagaagaaa ccttccctaa cactgaaacc aatggtgaat 240
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ctgatgagat ggttgaatta cgcattctgc ttcagagcaa gaatgctggg gcagtgattg 360
gaaaaggagg caagaatatt aaggctctcc gtacagacta caatgccagt gtttcagtcc 420
cagacagcag tggccccgag cgcattattga gtatcagtc tgatattgaa acaattggag 480
aaattctgaa gaaaatcatc cctaccttgg aagagggcct gcagttgcca tcaccactg 540
caaccagcca gctcccgtc gaatctgatg ctgtggaatg cttaaattac caacactata 600
aaggaagtga ctttgactgc gagttgaggc tggttgattca tcagagtcta gcaggaggaa 660
ttattggggt caaagggtgtc aaaatcaaag aacttcgaga gaacactcaa accaccatca 720
agctttttcca ggaatgctgt cctcattcca ctgacagagt tggtcttatt ggaggaaaac 780
ccgatagngt ttagagtgat ataaagatca tccttgatct tatatctgag tctcccatca 840
aaggacgtgc acagccttat gatcccaatt tttacgatga aacctatgat tatggtggtt 900
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gtgggttttg cagaatgcct cctgggtcggg gtgggcgtcc catgcctcca tctagaagag 1020
attatgatga tatgagccct cgtcagaggac cacctcccc tcctcccgga cgaggcggcc 1080
ggggtggtag cagagctcgg aatcttcctc ttcctccacc accaccacct agagggggag 1140

```

```

acctcatggc ctatgacaga agagggagac ctggagaccg ttacgacggc atggttggtt 1200
tcagtgctga tgaaacttgg gactctgcaa tagatacatg gagcccatca gaatggcaga 1260
tggcttatga accacagggg ggctccggat atgattattc ctatgcaggg ggctcgtggct 1320
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ctggatctat tattggcaaa ggtggtcagc ggattaaaca aatccgtcat gagtcgggag 1440
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gaacacagga ccagatacag aatgcacagt atttgctgca gaacagtgtg agcagwtma 1560
gwttagcttt gtgttagctt atacatacta aaacctttaa aaagcttttc ttctcaattg 1620
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aatcttgcc t ggnaggaagc cttgaaccaa gcaaacttct gcatttctct ggtgaaaact 1800
gctgccaaaa ccacttggtt aaaattgtac agagcctgta ggaaaatata gaagggtcca 1860
ttgggatgtt ggcttagttc tgtgtgggaa gacttagtgg attttggttg ttttagata 1920
actaaatcgg ccaacaaatc accgttctgg cctatgggac cgggcc 1966

```

<210> 357

<211> 1562

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (16)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (18)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (260)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (262)

<223> n equals a,t,g, or c

<400> 357

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atggaccaat actggggaat tggcagctctg gccagtggga taaatttggt cacaacagat 120
tttgagggcc cagttcttga tcacaggtat tatgcaggtg gatgctcccc gcattacatc 180
ctgaacacga ggtttaggaa gccctacaat gtggaaagct acacgccaca gacccaaggc 240
aaatacgaat tcatattaan anagtatgaa tcatactcag attttgaacg caatgtcaca 300
gagaaaaatg caagcaagtc tggtttcagt tttggtttta aaatacctgg aatatttgaa 360
cttgcatca gtagtcaaag tgatcgaggc aaacactata ttaggagaac caaacgattc 420
tctcatacta aaagcgtatt tctgcatgca cgctctgacc ttgaagtagc acattacaag 480
ctgaaaccca gaagcctcat gctccattac gagttccttc agagagttaa gcggctgccc 540
ctggagtaca gctacgggga atacagagat ctcttccgtg attttgggac ccactacatc 600

```

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acagaggctg tgcttggggg catttatgaa tacaccctcg ttatgaacaa agaggccatg 660
gagagaggag attatactct taacaacgtc catgcctgtg ccaaaaatga tttttaaatt 720
ggtggtgcca ttgaagaggt ctacgtcagt ctgggtgtgt ctgtaggcaa atgcagaggt 780
attctgaatg aaataaaaaga cagaaacaag agggacacca tgggtggagga cttggtggtc 840
ctggtacgag gaggggcaag tgagcacatc accaccctgg cataccagga gctgccgacg 900
gcggacctga tgcaggagtg gggagacgct gtgcagtaca acccagccat catcaaagtt 960
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aggcagaaca tgaagcaggc actggaggag ttccagaagg aagttagttc ctgccactgt 1080
gctccctgcc aaggaaatgg agtccctgtc ctgaaaggat cacgctgtga ctgcatctgt 1140
cctgttggtat cccaaggcct agcctgtgag gtctcctatc ggaagaatac cccatttgat 1200
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gagccctcaa gaactcaygc cagctcagcc ctacaccagt ttccacctgg agttcatgca 1440
agggcaaaaag gcagtgccat gcaagctgtt taaaataaag atgttacctt gtaaaatgca 1500
agttgattta aataaatact gagttaaagg ctttaaaaaa aaaaaaaaaa aaaggggggg 1560
cg 1562

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<210> 358

<211> 1931

<212> DNA

<213> Homo sapiens

<400> 358

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ctcgggagct cggactccta cgcatacccg ggaagggccg ccgccccgcc cgcggctgct 60
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ctcgaccca gctcggagcc cggagcgtgc ctcggcggcc tgcggtttt caccatggag 180
cagctgagct cagcaaacac ccgcttcgcc ttggacctgt tcctggcggt gagtgagaac 240
aatccggctg gaaacatctt catctctccc ttcagcattt catctgctat ggccatgggt 300
tttctgggga ccagaggtaa cacggcagca cagctgtcca agactttcca tttcaacacg 360
gttgaagagg ttcattcaag attccagagt ctgaatgctg atatcaacaa acgtggagcg 420
tcttatattc tgaaacttgc taatagatta tatggagaga aaacttacia tttccttcct 480
gagttcttgg tttcgaactca gaaaacatat ggtgctgacc tggccagtgt ggattttcag 540
catgcctctg aagatgcaag gaagaccata aaccagtggg tcaaaggaca gacagaagga 600
aaaattccgg aactgttggc ttcgggcatg gttgataaca tgaccaaact tgtgctagta 660
aatgccatct atttcaagg aaactggaag gataaattca tgaaagaagc cagcagcaat 720
gcaccattca gattgaataa gaaagacaga aaaactgtga aaatgatgta tcagaagaaa 780
aaatttgcac atggctacac cgaggacctt aagtgccgtg tgctggaact gccttaccac 840
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ttgtaagttt ggctctgttg gctgtttaca cccatgaatt ttggcatggg tatctatttt 1500
ycttttttac attgaaaaaa atccagtggg tgcttttgaa tgcataaagt aaagaagaag 1560
aaaagaatac atccgatgcg tagattcttg accatgtagt aatctataaa attgctatat 1620

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cctcctgata gccatgggaa aacatgataa gatggtcatt tattttgcag ttagaatttt 1680
ggaagccaca aaatagacag acaccctgac tgttgaaggg aggtttaaaa acagatattc 1740
aattgaaatg taagagagca cccaattga gagcccaggt tacgaagaca agcttgccctc 1800
gcctgacttt tctgtccctt gttctgcagg attagtattc tgttacagac ctctagtttt 1860
tagactcttc aattaaaggg ccaatgggta taacctgcaa aaaaaaaaaa aaaaaaaaaa 1920
aaaaaaaaaa a 1931

<210> 359

<211> 869

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (869)

<223> n equals a,t,g, or c

<400> 359

gctctggcgg gcataaccagc gggccctggc cgctcaccgg tggaaagtac aggttyctgac 60
agctggggccc tgtggtagga ggctggtaca aggttttggg tcggttcatc cctggcacca 120
ccaaagtggg tgcactgaag aagatgttgt tggatcaggg gggctttgcc ccgtgttttc 180
taggctgctt tctccactg gtaggggcac ttaatggact gtcagcccag gacaactggc 240
caaactacag cgggattatc ctgatgccct tatcaccaac tactatctat ggcttgcctgt 300
gcakttagcc aacttctacc tgggtccccc tcattacagg ttggccggtt tccaatgtgt 360
tgctgttatc tggaactcct acctgtcctg gaaggcacat cggctctaag cctgcctcac 420
tccatcgttt ccaccttgca gtgatgcagc ttgacctggg aacggtcaga caacctcctc 480
aaagtgggca taccagtttc cacgggggtt gggtgccggg cagagcttaa gaggactagc 540
acctgcaat gcccctcttc actctaaaat gtacactgac tgcttttagag cccttgataa 600
tagtcttatt cccaccacat actaggcact ccataaatat ctgttgaacc ttcattgacct 660
tatcaacttt acacctatcc cccagcaaat gccactcatc cccactcttc atagacacat 720
ttgttactct aacctgcct aggttctctt tagctccagc tcttttagaga ctcccggaa 780
cctttatatg gtgcctcagt aaatatgtta ttaaatatgt aatccggaaa aaaaaaaaaa 840
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 869

<210> 360

<211> 561

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (521)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (525)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (560)

<223> n equals a,t,g, or c

<400> 360

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ggcacgagag actccagccg ccaggggagc gcgtgccgtt cttgcctctc tggcctgcgc 60
ctcctgagcc gagtagatat cccggagttc cgcgcggcgc cagcccttcc gccacggccg 120
tctctggaga gcagcagcca tggccctacg ctaccctatg gccgtgggcc tcaacaaggg 180
ccacaaagtg accaagaacg tgagcaagcc caggcacagc cgacgccgcg ggcgtctgac 240
caaacacacc aagttcgtgc gggacatgat tcgggaggtg tgtggctttg ccccgtagca 300
gcggcgcgcc atggagttac tgaaggtctc caaggacaaa cgggccctca aatttatcaa 360
gaaaagggtg gggacgcaca tccgcgccaa gaggaagcgg gaggagctga gcaacgtact 420
ggccgccatg aggaaagctg ctgccaagaa agactgagcc cctcccctgc cctctccctg 480
aaataaagaa cagcttgaca gaaaaaaaaa aaaaaaaaaa ntcgnggggg ggcccgttac 540
ccattcgccc tawagggggn g                                     561
```

<210> 361

<211> 1680

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (33)

<223> n equals a,t,g, or c

<400> 361

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cgctgtttgc attaaaaggg tgggtgagtc aggaccctg gctcargagc cgyctctcct 180
aaaagagggt ttcaaggcca aatgggtttg tcaacggtgc tgtctccctt tcttgagat 240
gctcattagc ttatcaaaga ctgagaagtc ccgctgttac agaaataatt tagtttgctg 300
tattaactgc tcctgggcct ggagcagtat tcccacctta agattcccag catccctgtg 360
ctgtcccggc tctcattcat gccgaaggcc caaccattg gctgtgttct gtttgaagat 420
ttggggggcg ccttctcttt cttcccagg gaattctcta gcagaggag gggaccacc 480
ccagttagga agtagattgc tgccctctagc cagagacctg aactggggaa tttgaacatt 540
cctttacatt gttggagaaa tgaagccaaa gttattcaga tggttttccc aggctaaagg 600
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taccaaagag aagaaccact ctctggcgct ggggtgacct gctggctggg cctgtaagggt 720
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cctctctggg caccaggact cagtccagcc caagactact ctgggcagct cccatcccag 1500
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tctggggcca tttgcagact caggaaagga tttctacagt gttctataaa agccaaaaga 1560
 gagagtgggt ttgggaagag tgaggggtggg tggggagagg ggaccgatgt gcctcattgt 1620
 ttagtggtga ttacaaatat gcttttctgg ataaagttg gttgtttgct cttggaaaaa 1680

<210> 362

<211> 740

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (591)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (709)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (718)

<223> n equals a,t,g, or c

<400> 362

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 ctggcctgga agtttccctt ccagtctgga ttttgtctgc tccttccttc cccctcacc 120
 cgttacctct tcacctccca tctcatttca ctgtgtagct cagtctctcc cacgcacata 180
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 gcctcagtgg ccagccacat tgatgtcaca ctggaattgt taccacagag agggcgaaga 300
 gataggetat ctccccacct cccaccctac tccccactat attcccgttt tgaccacctc 360
 agccccctcag ctgccccctc tcactttggc caatcccagg caccaatcag acttcctcct 420
 ccacctggag cccctagcat ttcttgttcc cctcttcccc aaaacctctg taaagggtac 480
 gagagggacc ccctgcccag ccgcccgcga ctcaggggcag tccgatctaa gaagcagaag 540
 ctggttggag gctggctggg cctctgtcca gtccccagat gggataaact ngccttttct 600
 camatccctt cttgggtgcc tkgatcttcc tytgcccccg gggccaggac ccaactgtgt 660
 gttttcttgt tcagttttgt ggggaaagga accaagggtt ttgccaagna accagtttct 720
 tgaaagggtt tagggaaggg 740

<210> 363

<211> 1324

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (385)

<223> n equals a,t,g, or c

<400> 363

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gcgcgggtgct gggcacgcgac aacgtgtgcg agctggcggc gcggctgctc ttcagcaccg 240
tggagtgggc gcgccacgcg cccttcttcc ccgagctgcc ggtggccgac caggtggcgc 300
tgctgcgcct gagctggagc gagctcttcg tgctgaacgc ggcgcaggcg gcgctgcccc 360
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gcgccgtggc tttcatggac caggtgcgcg ccttccagga gcaggtggac aagctggggc 480
gcctgcaggt cgactcggcc gagtatggct gcctcaaggc catcgcgctc ttcacgcccc 540
acgcctgtgg cctctcagac ccggcccacg ttgagagcct gcaggagaag gcgcaggtgg 600
ccctcaccga gtatgtgcgg gcgcagtacc cgtcccagcc ccagcgcttc gggcgccctgc 660
tgctgcggct ccccgccctg cgcgcgggtcc ctgcctccct catctcccag ctgttcttca 720
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<211> 2853

<212> DNA

<213> Homo sapiens

<400> 364

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<211> 1837

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (3)

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<221> misc feature

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<220>
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<220>
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<223> n equals a,t,g, or c

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<210> 366

<211> 1823

<212> DNA

<213> Homo sapiens

<400> 366

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<210> 367

<211> 898

<212> DNA

<213> Homo sapiens

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<222> (17)

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 <221> misc feature
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 <223> n equals a,t,g, or c

<220>
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 <222> (30)
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<210> 368
 <211> 1117
 <212> DNA
 <213> Homo sapiens

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<212> DNA

<213> Homo sapiens

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<222> (35)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (36)

<223> n equals a,t,g, or c

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<211> 3636

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1937)

<223> n equals a,t,g, or c

<400> 370

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<210> 371

<211> 4039

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1085)

<223> n equals a,t,g, or c

<400> 371

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<210> 372

<211> 1599

<212> DNA

<213> Homo sapiens

<400> 372

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gatgtatcaa attgatgcaa atttagatgt tgatacttac aataaagttt ttaatgtgtt 1560
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<210> 373

<211> 464

<212> DNA

<213> Homo sapiens

<400> 373

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<210> 374

<211> 890

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (886)

<223> n equals a,t,g, or c

<400> 374

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<210> 375

<211> 1874

<212> DNA

<213> Homo sapiens

<400> 375

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aaaaaaaaaa aagc 1874
```

<210> 376

<211> 2018

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1997)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2012)

<223> n equals a,t,g, or c

<400> 376

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atcttaccac acactgtttt ttggcttgct tatgtgtagg tgaacagtca cgcctgaaac 1920
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aaaaaaaaaa aaaaccncgg gggggggccc gnacccca 2018

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<210> 377

<211> 818

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (818)

<223> n equals a,t,g, or c

<400> 377

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gccccatggt gactgatgac tttgtgggtc gtggcacctg cgccgaacaa atgtacggaa 540
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aagccatgct gaatgctgtg gaccgggatg cagtgtcagg catgggagtc attgtccaca 660
tcacagagaa ggacaaaatc accaccagga cactgaaggc ccgaatggac taaccctgtt 720
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aaaaaaaaaa accccggggg gggcccggaa ccaaattn 818

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<210> 378

<211> 2565
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1508)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (2565)
<223> n equals a,t,g, or c

<400> 378
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acaactgaag tctcttgaca aacacctcac ccctgcctcc gggatgaaag ggggtaacct 120
agacctgaat gggcttgacc atctcacaac tgctcgcgtg acgaccgcat tcgtggcagg 180
taagaagatt gctgtatcaa ctcaagaaa cagtaacttc actgtctttg tattttgaat 240
tgcaacaaca actttgatata caacaatgaa gcaatgatata ctaagaacma aagartatatt 300
gccaacagtc atcataatat caagtgattg tataagcaga aacaagctgt cacagacctg 360
tgcgctcagct aatatatgga gaatgcttct tctgatacta ttactttaga ggcagtttta 420
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tgttactttt tcccttccact gtagggcctc tccctgcaca gagcagtcctg tttagctgtg 2400
aacaccacaa tctgcagatg ttcaagtcctt ttacataaaa tggcatagta tttatatgta 2460
acctatgcat attctcctgt atatttttaa tcatctctac attaaaatac ctgataaaaat 2520
gtaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaggg ggggn 2565

<210> 379

<211> 1680

<212> DNA

<213> Homo sapiens

<400> 379

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aatagttaca cacaagaggg aaactggaag ccaaactg tacagtattg tgtagaaagt 180
cacctgccta ctctttttat tttacatgag tgctgatgtg ttttggcaga tgagctttca 240
gctgaggcct gatggaaatt gagataacct gcaaagacat aacagtattt atgagttata 300
tcttagttct tgaaattgtg gaatgcatga ttgacaatat atttttaatt tttatttttt 360
caagtaatac cagtactgtt taactatagc cagaactggc taaaattttt atattttcag 420
agttgaagt ggtgaagaca ttcattgattt aaacaccaga tcctgaaagg ggtaaattct 480
actttgaaat gaattctgaa tcagtatttc aaagcttttc tggtaatttt agtgatctta 540
tttgattaga ctttttcaga agtactaaat aagggaatttt aacagggtttt tattaatgca 600
cagataaata gaagtacagt gaggtctata gccattttat taaaatagct taaaagtttg 660
taaaaaaatg aatctttgta attacttaat atgttagtta agaaccctgc aagcttata 720
ttgctagact tacaaattat tttaaatgca tttatctttt ttgacactat tcagtggaa 780
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tttacagtct gtattagaca tactgttttt ataattgttt acttctgcct taagatttag 1560
gttttttaaa tgtatttttg ccctgaatta agtggttaatt tgatggaaac tctgctttta 1620
aatcatcat ttactgggtt ctaataaatt aaaaattaaa cttgaaaaaa aaaaaaacga 1680

<210> 380

<211> 1267

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (4)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (214)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1165)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1255)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1262)

<223> n equals a,t,g, or c

<400> 380

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aatacattgt attaatacca aagtgtttgg tcattttaag aatctggaat gcttgctgta 120
atgtatatgg ctttactcaa gcaratctca tctcatgaca ggcagccacg tctcaacatg 180
ggtaaggggg ggggggtggag gggaatgtgt gcancgtttt tacctaggca ccatcattta 240
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gtcaagattt tacttggcat tgagtagttt ttttcaatag taggtaattc cttagagata 360
cagtatacct ggcaattcac aaatagccat tgaacaaatg tgtgggtttt taaaaattat 420
atacatatat gagttgcta tatttgctat tcaaaatttt gttaaataatgc aaatcagctt 480
tataggttta ttacaagttt tttaggattc ttttggggaa gagtcataat tcttttgaaa 540
ataaccatga atacacttac agttaggatt tgtggtaagg tacctctcaa cattaccaa 600
atcatttctt tagaggggaag gaataatcat tcaaatgaac tttaaaaaag caaatttcac 660
gcactgatta aaataggatt attttaarta caaaaggcat tttatatgaa ttataaactg 720
aagagcttaa agatagttac aaaatacaaa agttcaacct cttacaataa gctaaacgca 780
atgtcatttt taaaaagaag gacttagggg gtcgttttca catatgacaa tgttgcat 840
atgatgcagt ttcaagtacc aaaacgttga attgatgatg cagttttcat atatcgagat 900
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taagcaaaat gccaaaaggg gtctnaattg aartgaaaat gtaattttgt ttttaaaata 1200
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anaaatt 1267

```

<210> 381

<211> 1031

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1015)

<223> n equals a,t,g, or c

<400> 381

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gccactggaa aacctttcag gccgccccca tcagtgggct ccaaagtaaa tggctgaaaa 120
caaaaatggt tcaacttcta acagttttcc tttttccact gtgtgactga aagctcctat 180
atcattttat atttctgaat ctataaaaca aaacaaacaa gcctgamagt gtctggarga 240
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tacgtacctt aaggcaccca gtctactagt ctgtggggtc ctggagcctg tctcttcttt 360
ctggagggtt aaactgaata gcaataatta cgttacccaa agcatgtgga ggaaaagtga 420
aaccagccac ggagacgctg gccacgggc tcggcctgcg gtgtggcctg ctttgctcac 480
cagcgtcagc cgctcatttc cttctcatga agtcccatct ggcatgggg acgagggccg 540
ggagggcacc gggtagcctt ttcacacttg gggattaggg gagtgagaaa agatttgggc 600
catgcatgca aagtcaaagt ttaaaatttt atccttttca aatagatgat ataataacc 660
tatacatgat ataataattg tataatatga atctctctat atttgtttaw tttgagccat 720
tcaatctaaa ccaatgtaca ggtgtacaat gaaaaattta aatgcttagt tatttttccc 780
aacacagtgt aaagtcaccc tcctctgaga gtgggatgtg cagagttttg atgttgacgc 840
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gggtgggggt tgaaagttgt tatctttaa tacatgtaca aatcgttgtc aaaagtaacg 960
ttattaaaat agatttatta tccctgaaaa aaaaaaaaaa aaaaaaaaaa aaancccg 1020
gggggggccc c                                     1031
```

<210> 382

<211> 1597

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1577)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1579)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1597)

<223> n equals a,t,g, or c

<400> 382

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gataggcgac acgccgrrcg gcggctgagg cgggaatggc tgctgtactg cagcgcgtcg 120
agcggctgtc caatcgagtc gtgcgtgtgt tgggctgtaa cccgggtccc atgaccctcc 180
aaggcaccaa cacctacct gtggggaccg gccccaggag aatcctcatt gacctggag 240
aaccagcaat tccagaatac atcagctgtt taaagcaggc tctaactgaa ttaacacag 300
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```

caatccagga aattgtagtg actcactggc accgagatca ttctggaggc ataggagata 360
tttgtaaaag catcaataat gacactacct attgcattaa aaaactccca cggaatcctc 420
agagagaaga aattatagga aatggagagc aacaatatgt ttatctgaaa gatggagatg 480
tgattaagac tgagggagcc actctaagag ttctatatac ccctggccac actgatgac 540
acatggctct actcttagaa gaggaaaatg ctatcttttc tggagattgc atcctagggg 600
aaggaacaac ggtatttgaa gacctctatg attatatgaa ctctttaaaa gagttattga 660
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aaattcaaca atacatttct cacagaaata ttcgagagca gcaaattctt acattatttc 780
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atctattggt tccataactc tgtatcatgt gtattttctt attctggtat accacaaatg 1500
attcatgcaa atgaattttt ggtgattgaa aaatattaaa ttcccaattt aaagtaaaaa 1560
aaaaaaaaaa aaaaaangnc cccggggggg ggccggn 1597

```

<210> 383

<211> 175

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (95)

<223> n equals a,t,g, or c

<400> 383

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gtgagtgggtg actatgggca tcctgtgtat atcgtgcagg atggggccccc ccagagccct 60
ccaaacatct actacaaggt atgagggctc ctctnacgtg gctatcctga atccagccct 120
tcctgggggtg ctctccagt ttaaattcct ggtttraggg acamctstaa catct 175

```

<210> 384

<211> 2171

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2166)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2170)

<223> n equals a,t,g, or c

<400> 384

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ggctacattt attgaagaat tggaggctgt tgaagccaag gaaaaacaag atgaacaagt 120
cggacttcct gggaaagtgg ggaaggccaa ggggaaaaaa acacaaatgg ctgaagtttt 180
gccttctccg cgtggtcaaa gagtcattcc acgaataacc atagaaatga aagcagaggc 240
agaaaagaaa aataaaaaaga aaattaagaa tgaaaatact gaaggaagcc ctcaagaaga 300
tggtgtggaa ctagaaggcc taaaacaaag attagaaaag aaacagaaaa gagaaccagg 360
tacaaagaca aagaaacaaa ctacattggc atttaagcca atcaaaaaag gaaagaagag 420
aatccctgg tctgattcag aatcagatag gagcagtgc gaaagtaatt ttgatgtccc 480
tccacgagaa acagagccac ggagagcagc acaaaaaaca aaattcacia tggatttggg 540
ttcagatgaa gatttctcag attttgcag aaaaactgat gatgaagatt ttgtcccatc 600
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tgccaaaaaa agggctgccc caaaaggaac taaaagggat ccagctttga attctggtgt 900
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aatgttatat tgataacat gctcagcaat gagctattag attcattttg ggaaatctcc 1980
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agtaatgtta tcaacgtttt tgtaaatatt tactatgttt ttctattagc taaattccaa 2100
caattttgta ctttaataaa atgttctaaa cattgcaaaa aaaaaaaaaa aaaccccg 2160
gggggnccn g 2171

```

<210> 385

<211> 2364

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (19)

<223> n equals a,t,g, or c

<400> 385

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gcctaccaga tgccagtcac cgcacaaggc actgggtata tggatcccc aaacaagaga 180
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tatgtaaatc acttcattgt tttaaaggaa taaacttgat tatattgttt ttttatttgg 420
cataactgtg attcttttgg gacaattact gtacacatta aggtgtatgt cagatattca 480
tattgaccca aatgtgtaat attccagttt tctctgcata agtaattaaa atatacttaa 540
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aaacttctat gtaaaaatca ctatgatttc tgaattgcta tgtgaaacta cagatctttg 660
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2364

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<211> 2864

<212> DNA

<213> Homo sapiens

<400> 386

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<210> 387

<211> 2683

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (40)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2649)

<223> n equals a,t,g, or c

<400> 387

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<210> 388

<211> 1446

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (35)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (37)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (57)

<223> n equals a,t,g, or c

<400> 388

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1446

<210> 389

<211> 723

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (705)

<223> n equals a,t,g, or c

<400> 389

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723

<210> 390

<211> 1046

<212> DNA

<213> Homo sapiens

<400> 390

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1046

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 <211> 699
 <212> DNA
 <213> Homo sapiens

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<210> 392
 <211> 1545
 <212> DNA
 <213> Homo sapiens

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 <222> (24)
 <223> n equals a,t,g, or c

<220>
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<220>
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 <222> (54)
 <223> n equals a,t,g, or c

<220>
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 <222> (58)
 <223> n equals a,t,g, or c

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<210> 393

<211> 749

<212> DNA

<213> Homo sapiens

<220>

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (748)

<223> n equals a,t,g, or c

<400> 393

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<210> 394
<211> 611
<212> DNA
<213> Homo sapiens

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<211> 1856
<212> DNA
<213> Homo sapiens

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<222> (1851)
<223> n equals a,t,g, or c

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<210> 396

<211> 2651

<212> DNA

<213> Homo sapiens

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<221> misc feature

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<223> n equals a,t,g, or c

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<221> misc feature

<222> (47)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2642)

<223> n equals a,t,g, or c

<400> 396

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<210> 397

<211> 2507

<212> DNA

<213> Homo sapiens

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<222> (2489)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2496)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2504)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2505)

<223> n equals a,t,g, or c

<400> 397

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<210> 398

<211> 1273

<212> DNA

<213> Homo sapiens

<220>

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<223> n equals a,t,g, or c

<220>
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<223> n equals a,t,g, or c

<220>
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<222> (1252)
<223> n equals a,t,g, or c

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<210> 399
<211> 3774
<212> DNA
<213> Homo sapiens

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ttgatgttac ctgactgtca taaagatgaa ratgatttgt atkggtatga matgcttatc 3480

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tttatctack tcgtaagggt arggtaatta acgctgtgac tccacgaact tgccactgca 3540
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gcagcctccg taatgcagca attggaggat ggggtcgccct taccagctc cagggggtgg 3660
gacattggcg agatgtgggt cccgttgccg cgggcaggac tggtctgcac tagggacacc 3720
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<210> 400

<211> 1522

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (479)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1471)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1481)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1487)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1501)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1508)

<223> n equals a,t,g, or c

<400> 400

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caactggaat gagattgttg ataactttga tgatatgaat ttaaaggagt ctctccttcg 180
tggcattctat gcttacggtt ttgagaagcc ttccgctatt cagcagagag ctattattcc 240
ctgtattataa gatccaaaag gtaattcttg cacttgagga ctatatggga gccacttgtc 300
atgcctgcat tggtggaaca aatgttcgaa atgaaatgca aaaactgcag gctgaagcac 360
cacatattgt tgttggtaca cccgggagag tgtttgatat gttaaacaga agataccttt 420
ctccaaaatg gatcaaaatg tttgttttg atgaagcaga tgaaatgttg agccgtggnt 480
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```

```

ctttctgccca caatgccaac tgatgtgttg gaagtgacca aaaaattcat gagagatcca 600
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aatgttgaga gagaggaatg gaagttggat acactttgtg acttgtaga gacactgacc 720
attacacagg ctgttatttt tctcaatacg aggcgcaagg tggactggct gactgagaag 780
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```

<210> 401

<211> 1370

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1223)

<223> n equals a,t,g, or c

<400> 401

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ccccctcttc acagagctgc tcaatggcat ccgcgccatg gaggaccag gtgtcaggga 180
cacattgctg caggccctga ggtttgtgat tcaggagca ggggccaaag tggatgccgt 240
catccgaaaa aacatcgtct cactcctgct gagcatgctg ggacacgatg aggacaacac 300
tcgcatctcc tcagccgggt gcctagggga actgtgtgcc tttttgactg aagaggagct 360
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gcacggggcg agctggcact ttccgtgget gtgaatgtgg ctcttggcag actttgtgcc 480
ggcagatata gcagtgatgt tcaggaaatg atcctgagca gtgccacggc ggacaggatc 540
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ggcggaggggc agttgccggc caaactttcc agcctgttcg ttaagtgtct gcagaaccca 660
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gataagaaca ccgtggtcag ggcctacagc gaccaggcaa ttgtcaacct cctcaagatg 840
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ggaaaagcac acgcatgcgc ctncagcaaa tggcagccca ggagctgttt gtccakttta 1260
ggcatggcta ggtctgggaa ctattaatag gcagggtcag aytktggggg tctcttctc 1320

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1370

<210> 402

<211> 1412

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (51)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1406)

<223> n equals a,t,g, or c

<400> 402

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ggaagagatt	tgtggtggtg	acaaaccatt	tctggcccca	aatgacttgc	agaccaaaca	180
cctgcaactt	aaggaagaat	ctgtgaagct	attccraggg	gtgaagaaga	tgggtgggga	240
agaattttagc	cggcgttacc	tgcagcagtt	ggagagtga	atagatgaac	tttcatcca	300
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gtttgtagtc	atctttatca	catatgtgat	tgctggtgtg	actggattca	ttggtttgga	420
catcatagct	agcctatgca	atatgataat	gggactgacc	cttatcacc	tgtgcacttg	480
ggcatatatc	cggctactctg	gagaataccg	agagctggga	gctgtaatag	accaggtggc	540
tgcagctctg	tgggaccagg	ctttgtacaa	gctttacagt	gcagcagcaa	cccacagaca	600
tctgtatcat	caagctttcc	ctacaccaaa	gtcggaatct	actgaacaat	cagaaaagaa	660
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agttttatgt	ctccatgcaa	acattcaaag	tgcttccatc	agaacggagt	aaaatactaa	780
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gtttaataga	atataaacct	cttgataaaa	aatgcacaaa	aatcacctt	gtatatgtga	1260
gtttcactgc	attgtatatt	ttttcatttg	gtacacaaag	aatgtattct	tcataggttt	1320
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aaaaaaaaaa	aaaaaaaaaa	aaaaanaaaa	aa			1412

<210> 403

<211> 1750

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (40)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (44)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (70)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (107)

<223> n equals a,t,g, or c

<400> 403

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ggaattcggn cagtgggcat ggcgactttt tctggcccg ctgggcnaat cctgtcgctt 120
aatccgcaga agatgtcgag ttcaaaaagg aggtggcgca ggttcgcaag cgcataacc 180
agcgaaaaaa acaagaacaa cttactcctg gagtagtcta tgtgcgccac ctacctaacc 240
tacttgacga aaccagatc tttcatatt tctccagtt tggcactgtg acacggttca 300
ggctgtccag aagtaaaagg actggaaata gcaaaggcta tgcatttgtg gagtttgagt 360
ctgaggatgt tgccaaaata gttgctgaaa caatgaacaa ctacctgtt ggtgaaagac 420
tcttgagtg tcattttatg ccacctgaaa aagtacataa agaactctt aaagactgga 480
atattccatt taagcagcca tcatatccat cagtgaacg gtataatcg aatcggacac 540
taacacaaaa gctacggatg gaggagcgat ttaaaaagaa agaaagatta ctcaggaaga 600
aattagctaa aaaaggaatt gactatgatt ttccttctt gattttacag aaaacggaaa 660
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aaaaagtttc aggtactctt gacactcctg agaagactgt ggatagccag ggccccacac 780
cagtttgtag accaacattt ttggagaggc gaaaatctca agtggctgaa ctgaatgatg 840
atgataaaga tgatgaaata gttttcaaac agcccatatc ctgtgtaaaa gaagaaatac 900
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ttataccagt atcatcagtg aagaattgta tttcaagatt caaacaataa ccagcaatta 1620
aacttttttc tacaatgtat ttgtttgcga gtaggacttg ggagtcattg ggaaaaaaaa 1680
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ataataaatt ttcccccttca ttaacgaatt cagactcatt aaaaacattg ccatcagaaa 1740
aaaaataaaa 1750

<210> 404

<211> 1339

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (150)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1330)

<223> n equals a,t,g, or c

<400> 404

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ctgttacaga gtgtgacaga ggatccatgt ctgtgacaca ggacggtggg aagcctgaga 120
gagagtga aa ttatgtgata cactgaaatn acttttgttt ttcttctaac tcatacaaaa 180
ctgggtttgga aagtctttgc tttggaagcg tcagacatta gaacaggcca aactggactg 240
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cgtgtcctgc gtgtcttca ccctctgggg cgcccctgct gcggctggca ggtgcagaca 360
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cactgtgagg ctgtgagaga tttgtggcag gaactgttta tgaggctcta gttgttgctg 480
ttgtggcggg aaagttaaga aacatagccc ttaaggaaac cacctttatg tattttctta 540
aagcacgctt ttaaataaagc aaaaacttta aaaggcagga aagagaattc ttaggcaaat 600
tcagagaaat aagtgttagt taataactaat cacctcctcc tctgtctctc atcctccttt 660
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tatcagggtc tgtttgactt aggtctttca gttttccttt cggttccctt taaaaaatgt 1320
gattgttaan ctgcctctt 1339

<210> 405

<211> 482

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (440)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (469)

<223> n equals a,t,g, or c

<400> 405

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cacctaccca caaactagtg gatgataaat tttggctatt cagaagacgt ttattatagg 180
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tctgacattg tcggtggttt atcctgggtc caggaaataa gactagcctt ttcctcatga 300
tagtctttgg tggtttttaa aacagttggt taagtcaaca gatgtatcat atgcctgaca 360
ctgctctaca ccagtgaata atttacactc taataggggg tggttaactat aaagatgata 420
aacatagcat cttaattggn gtgtgtatga aggtggtgtg tacctcttnc tagccacca 480
gg                                                    482

```

<210> 406

<211> 1413

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (9)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (24)

<223> n equals a,t,g, or c

<400> 406

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ttatttctgt tcggggccca tctatcctgg acacggcatg atgttcgtcc gcaacgattg 180
caagggtgttc agattttgca aatctaaatg tcataaaaac tttaaaaaga agcgcaatcc 240
tcgcaaagtt aggtggacca aagcattccg gaaagcagct ggtaaagagc ttacagtggg 300
taattcattt gaatttgaaa aacgtagaaa tgaacctatc aaataccagc gagagctatg 360
gaataaaaact attgatgcga tgaagagagt tgaagaaatc aaacagaagc gccaaagctaa 420
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gcattgccat ctacataata tcagatatta cggatgttag attgcatctc agtgttaaat 780
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aactaatggc aaaaattcat ggctagtgat gtataaaaata aaatattctt tgcagtaaaa 960
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```

cagtgtcaga tatttttatt ttagtatttc ctgttttggt ttatttgcat cttagaagag 1080
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```

<210> 407

<211> 1693

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1548)

<223> n equals a,t,g, or c

<400> 407

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acgtggattt gcctcaggtg cggagccgca gctacaggag gatgctcgcg aggaccccc 420
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agagtttgag cagccttctt ggctgcaggc aggcctagcc tgtggcancg ggctagggcc 1560
cgcagagcat ttggtgcccc tccatgttgc aatgcaaaca ccttcaccac tggggcagtg 1620
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tcgagacagt tct 1693

```

<210> 408

<211> 1342

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (107)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1332)

<223> n equals a,t,g, or c

<400> 408

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<210> 409

<211> 2417

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (107)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (680)

<223> n equals a,t,g, or c

<400> 409

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<210> 410

<211> 1401

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1394)

<223> n equals a,t,g, or c

<400> 410

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<210> 411

<211> 3016

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (399)

<223> n equals a,t,g, or c

<400> 411

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agagaaaatt gagacggagc taagagatat ctgcaatgat gtactgtctc ttttggaata 540
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```

<210> 412

<211> 958

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (930)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (934)

<223> n equals a,t,g, or c

<400> 412

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<210> 413

<211> 500

<212> DNA

<213> Homo sapiens

<400> 413

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atcagagtgc cttttttttt tttgttcaaa tgattttaat tattggaatg cacaattttt 420
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<210> 414

<211> 3397

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1)

<223> n equals a,t,g, or c

<220>

<221> misc feature
<222> (15)
<223> n equals a,t,g, or c

<220>
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<223> n equals a,t,g, or c

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<221> misc feature
<222> (3081)
<223> n equals a,t,g, or c

<400> 414
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<210> 415

<211> 2880

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (5)

<223> n equals a,t,g, or c

<400> 415

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<210> 416

<211> 1616

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (12)

<223> n equals a,t,g, or c

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<222> (1610)

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<222> (1611)

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<220>

<221> misc feature

<222> (1616)

<223> n equals a,t,g, or c

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<210> 417

<211> 1815

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (270)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1184)

<223> n equals a,t,g, or c

<400> 417

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<210> 418

<211> 1966

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (15)

<223> n equals a,t,g, or c

<400> 418

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<210> 419

<211> 2852

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (2838)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2843)

<223> n equals a,t,g, or c

<400> 419

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<210> 420

<211> 2705

<212> DNA

<213> Homo sapiens

<400> 420

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2705

<210> 421

<211> 1901

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1828)

<223> n equals a,t,g, or c

<400> 421

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cysagggggg ggcccggtcc caattcgccc tatagttagt c 1901

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<210> 422

<211> 2477

<212> DNA

<213> Homo sapiens

<400> 422

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tcagggagga acaggagtat gaagaagagg tggaggaaga accccgcccg gcagccaagg 540
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taatcacagt agaaacagtg atccaggaaa atgtaggtgc ccaaaagata cccggagaga 660

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gttcagagcc accagtggta aaaacagaga tggtaacaat ttctgatgcc tcacaaaagga 840
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aaaaaaaaaa actcgag 2477

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<210> 423

<211> 777

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (759)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (764)

<223> n equals a,t,g, or c

<400> 423

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tggtgccatc atggctgacc ccgacccccg gtaccctcgc tcctcgatcg aggacgactt 120
caactatggc agcagcgtgg cctccgccac cgtgcacatc cgaatggcct ttctgagaaa 180

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agtctacagc attctttctc tgcaggttct cttactaca gtgacttcaa cagttttttt 240
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cctcggatct ctgggtttga tttttgcgtt gaytttaaac agacataagt atccccctaa 360
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aatggagttg gtcttagccg ctgcaggagc ccttcttttc tgggggatc atcatctatg 660
acacacacta ctgatgcata aactgtcacc tgaagagtag gtatttagctg gcatcaagcc 720
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<210> 424

<211> 1649

<212> DNA

<213> Homo sapiens

<400> 424

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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1649

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<210> 425

<211> 1608

<212> DNA

<213> Homo sapiens

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<221> misc feature
<222> (1598)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1600)
<223> n equals a,t,g, or c

<400> 425
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gttggtggtgg accgtgcgcg tgcgcctggg ggcaccgctg ccgttccgag ccatccgggt 180
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<210> 426
<211> 1794
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (1789)
<223> n equals a,t,g, or c

<220>
<221> misc feature

<222> (1790)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1793)

<223> n equals a,t,g, or c

<400> 426

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<210> 427

<211> 770

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (14)

<223> n equals a,t,g, or c

<220>

<221> misc feature
<222> (40)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (97)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (618)
<223> n equals a,t,g, or c

<400> 427
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taaaaaatag aaattatctc actacttaaa tcccatTTTT ttcacttcat atgaaagaac 180
atattgatag tatattctat attatttcat agatctgtct gaaagagatt gggaacaaaa 240
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<210> 428
<211> 512
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (18)
<223> n equals a,t,g, or c

<220>
<221> misc feature
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<220>
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<222> (38)
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<220>
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<222> (484)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (491)

<223> n equals a,t,g, or c

<400> 428

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ggactgtacc tgcacgggg ctgggcgagg gagaataagc tgtaccatcg caaaccgctg 180
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tggttacatg ttagagtgtg tgtgtcttgg taatggaaaa ggagaatgga cctgcaagcc 300
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ggagaagccc taccaaggct ggatgatggt agattgtact tgcctgggag aargcagcgg 420
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attngagaca ncttgagcaa gaaggataat cg 512
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<210> 429

<211> 1470

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1346)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1347)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1357)

<223> n equals a,t,g, or c

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<221> misc feature

<222> (1387)

<223> n equals a,t,g, or c

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<221> misc feature

<222> (1415)

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<222> (1454)

<223> n equals a,t,g, or c

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<222> (1462)

<223> n equals a,t,g, or c

<400> 429

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<210> 430

<211> 434

<212> DNA

<213> Homo sapiens

<400> 430

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<210> 431

<211> 1823
<212> DNA
<213> Homo sapiens

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<223> n equals a,t,g, or c

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<210> 432
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 <212> DNA
 <213> Homo sapiens

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<210> 433

<211> 2553

<212> DNA

<213> Homo sapiens

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<221> misc feature

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (2516)

<223> n equals a,t,g, or c

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<210> 434

<211> 2532

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (2470)

<223> n equals a,t,g, or c

<400> 434

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2532

<210> 435

<211> 1822

<212> DNA

<213> Homo sapiens

<400> 435

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1822

<210> 436

<211> 1030

<212> DNA

<213> Homo sapiens

<400> 436

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cagatcaaga cagcacgtac caccatggca ggcctgacca tggaggaact tatccagttg 180
gttgctgcac gactggcaga acatgagcgg gtggcagcaa gtactcagcc acttggtcgc 240
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cacaaggagt gtatcaaatt ctgggccag accaacacaa atgacacttg tcccttttgt 480
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gaagcgcggg ttcaagattt ctaaaactct atatttatac agtgacatat actcatgcc 600
tgtacatttt tattatatag gtaatgtgtg tatagaaagt ctgtattcca atgttcgtaa 660
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cattctgctt tggtttggt cagcctctag tccatttcct taaggctcat gtatgcagat 900
ttaaagcctg gtgctcacc actgtccaac cagatgcctt gcttaccgaa agcctccaga 960
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aaaaaaaaag 1030
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<210> 437

<211> 1632

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (14)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1602)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1616)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1617)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1628)

<223> n equals a,t,g, or c

<400> 437

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gccccttccg tggacggctc tgtggcctct gtgggaactt caatggcaac tggagtgcag 180
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cctacacggc ggccgtgcag gcagctggcg tggccgtgaa gccctggagg acagacagct 540
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gatcctgtgc ggctctctcc ggctcacagg gctgcaccac ccgtgtttt gagggtgtgt 660
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gagcgcagga cttctcccca tgttatggct gatcagtcac ccaccaggaa cgaagatttc 1440
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accctgtct accgcttttc tgggtcacag aggccaaatg tgagagcatt gaataaatat 1560
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attcccgnnt cc 1632
```

<210> 438

<211> 1016

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (27)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (993)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (994)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (995)

<223> n equals a,t,g, or c

<400> 438

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tactccactg ccctggcagc agcaggtgtg gccaatggag gggggtgctg gccccagga 120
ttccccagc caaactgtct ttgtcaccac gtggggctca cttttcatcc ttccccaaact 180
tccctagtc ccgtactagg ttggacagcc cccttcggct acaggaaggc aggaggggtg 240
agtcccctac tccctcttca ctgtggccac agcccccttg ccctccgcct gggatctgag 300
tacatattgt ggtgatggag atgcagtcac ttattgtcca ggtgaggccc aagagccctg 360
tggccgccac ctgaggtggg ctggggctgc tcccctaacc ctactttgct tccgccactc 420
agccatttcc ccctcctcag atggggcacc aataacaagg agctcaccct gcccgctccc 480
aacccccctc ctgctcctcc ctgcccccca aggttctggt tccatttttc ctctgttcac 540
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gactacccca gtcccaggga aggtggggcc ctgcccctag gatgctgcag cagagtgagc 780
aagggggccc gaatcgacca taaaggtgt aggggccacc tcctccccct gttctgttgg 840
ggaggggtag ccatgatttg tcccagcctg gggctccctc tctggtttcc tatttgcagt 900
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aannnggggg gggccccccc ccccca 1016
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<210> 439

<211> 594

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (476)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (519)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (530)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (531)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (539)

<223> n equals a,t,g, or c

<400> 439

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ctcgggctgg ggctgctgct gctggcactg ctccctacca cgcagattta ttccagtga 180
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aatccaacta atgccaccac caaggyggct ggtggtgccc tgcagtcaac agccagtctc 300
ttcgtggtct cactctctct tctgcatctc tactcttaag agactcaggc caagaaacgt 360
cttctaaatt tccccatctt ctaaacccaa tccaaatggc gtctggaagt ccaatgtggc 420
aaggaaaaac aggtcttcat cgaatctact aattccacac cttttaaaaa ttttngggga 480
acccaaccca aagggtaaaa aaaaaaaaaa atttggggnt ttttttgggn naaaggggna 540
aaaaaaattt ttcccccccc ccccaaaaaa aaaaaaaaat tttttttttt tttt 594
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<210> 440

<211> 1580

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (873)

<223> n equals a,t,g, or c

<400> 440

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ctgctgctgc tctgcaaaat tcagctgctg cctctgtctt gaggaccca gcgcctttcc 120
cccggggcca tctgctcctg agccacagcc tccctcctgg gggccctcct cactgcctgc 180
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ccccctaata aggagtgc atggaccata acgggtcccc agggccagac tgtgtccctc 360
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ttcgtggtg ctgggacttc cggccagcgg ctcgagcgt tttgtgggac cttccggcct 480
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ggaggacgag gcttctgtct ctggtacagc gggcgggcca cctcgggcac tgagcaccaa 600
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tgcccaagc agtgccgccg gacaggcacc ttgcagagca acttctgtgc cagcagcctt 1140
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gtggttctcc accggcccaa ccaggaccag atctcacca acctagcaa gaggaagtgc 1440
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ccctctcaac ctgtgcgggc tgctgcgtcc caggactgag acgcaggcca gccccggccc 1500
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<210> 441
 <211> 1082
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (136)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (462)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (465)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (1074)
 <223> n equals a,t,g, or c

<400> 441
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 tccgtgggt gtcactcggg ggtggggaag atggccatt caaaagcgcc gcgagggggc 120
 ccggccagtg cccttnagtg agcgctcgca agaggacggc agaggcccgg cagctcggag 180
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 caaccccagc cccaatcaca accccagcct cagccccaac ccaagcctca gcccagcagc 1020
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<210> 442

<211> 1241

<212> DNA

<213> Homo sapiens

<400> 442

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ctttcattgt cttttccgcc cgcttcgacg gcctcgsgcc ggctgctctt tccgggattt 180
tttatcaagc agaaatgcat cgaacaacga gaatcaagat cactgagcta aatccccacc 240
tgatgtgtgt gctttgtgga gggacttcca ttgatgccac aaccataata gaatgtctac 300
attccttctg taaaacgtgt attgttcgtt acctggagac cagcaagtat tgccttattt 360
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aagatattgt atacaaatta gttccagggc ttttcaaaaa tgaaatgaag agaagaaggg 480
atttttatgc agctcatcct tctgctgatg ctgccaatgg ctctaataag gatagaggag 540
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aattctttga ccagaacaga ttggatcgga aagtaaaca agacaaagag aaatctaagg 660
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cagtaaatgg gtcatcagca acttcttctg gttgatacct gagactgtta agggaaaaaa 1200
aaaaaaaaa accccggccg ctcccacttc agattggtaa c 1241
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<210> 443

<211> 968

<212> DNA

<213> Homo sapiens

<400> 443

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agtattttca gagaaaattg aagggttttt taaacatcac tggatttctt gattgaggaa 180
acaagtctg aaataatagc acaatttcaa agaagagact ctttgcaaag ttgataacat 240
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atgagacgta tagtattcat ttttaaatgc atgattgtac attatgtata gacgacaatg 840
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aaaaaaaaa 968
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<210> 444
 <211> 1360
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (114)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (302)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (330)
 <223> n equals a,t,g, or c

<400> 444
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 tccctgcccc agccagcat ccccgcggt gtcccgaga gtgctccacc gganccccac 120
 cggaagaga ccgtgaccgc caccgccact tcccaggtag cccagcagcc tccagccgct 180
 gccgcccctg gggaacaggc cgtcgcgggc cctgcccctc gactgtcccc agcagtacca 240
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 caggatgata tcgaagagct ggagaccaag gccgtgggaa tgtctaacga tggccgcttt 420
 ctcaagtttg acatcgaaat cggcagaggc tcctttaaga cggctctaca aggtctggac 480
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 gagaggcaga gatttaaaga agaagctgaa atgttaaaag gtcttcagca tcccaatatt 600
 gttagatttt atgattcctg ggaatccaca gtaaaaggaa agaagtgcag tgttttggtg 660
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 ccagccagtt ttgacaaagt agcaattcct gaagtgaagg aaattattga aggatgcata 1140
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 gaggaacag gagtacgggt agaattagca gaagaagatg atggagaaaa aatagccata 1260
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<210> 445
 <211> 1835
 <212> DNA
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<220>

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<222> (1806)
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<220>
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<223> n equals a,t,g, or c

<400> 445

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ggagmstttt ggtggaagct cagaaattgt tgaccagctg gaggtggaga taagaaatat 600
gactctcttg gtagagaagc ttgagacact agacaaaaac aatgtccttg ccattcgccg 660
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<210> 446

<211> 1355

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (55)

<223> n equals a,t,g, or c

<400> 446

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agaagtggag gagctcgccg aggaggtgct ggcggacaag cggcagattg tggacctgga 180
cactaaaagg aatcagaatc gagaggcct gagggccctg cagaaggatc tcagcctctc 240
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ggaaatgatt gaaaaagatc aagatcatct ggataaagaa atagaaaaac tgcggaagca 360
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gtggatgcgc ctcttaccat atgacacgtg tcaagatgcc cttccgcccc ctctgaaagt 1200
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<210> 447

<211> 375

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (153)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (313)

<223> n equals a,t,g, or c

<400> 447

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ggtatctttg tctcacatct ggctgtttcc tcctagagaa ccatccagtt ggctttccag 120
gtctggaggt gagctaattg atgagtgaat atnagcagtg ggtgttcctc atctctttga 180
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<210> 448

<211> 1393

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1360)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1383)

<223> n equals a,t,g, or c

<400> 448

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tcctatgcat taaataattt tcctgacgag ctcaagtgtc ccctctggtc tacaatccct 180
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cagccagaac atttgtgggtc tatttctctg ttagtggtta accaaccatc tgttctaaaa 360

gaagggctga actgatggaa ggaatgctgt tagcctgaga ctcaggaaga caacttctgc 420
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gaggaagctg agcagacccc tgtgatgcct gtgacctcaa ttaaagcaat tcctttgacc 1320
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aanaaaaaaa aaa 1393

<210> 449

<211> 1663

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (57)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (180)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (621)

<223> n equals a,t,g, or c

<400> 449

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gccagcaaaag ccctcagagg ccacctcaga ccggtcagag gccagcagcc gggacgcagn 180
ggtagcgacg agaacgagga gtcgagcgtt gtggattacg tggaggtgac ggtcggggag 240
gaggatgcga tctcagatag atcagatagc tggagtcagg ctgcggcaga aggtgtgtcg 300
gaactggctg aatcagactc cgactgcgtc cctgcagagg ctggccaggc ctagacaggg 360
aagtctgtta gaactgctgt gctgatcaac gggacgtcc gtctttgaag aaagaagaga 420
tggctctctc ccagccatgg gccacccttg ccagtrctc caagtggaac tacttagctc 480
gcgtgtgcct ggarggtgcg ggaagtcctc cgactctcag acgcacctcc cagaggaccg 540
gtggggaattg ttcatagtgc caaagtccta mtactgcgtt ttcaatgggt ccttgtacat 600
agtttgctcc tctgsctag ncctcacctc ttgctatact ggraccgatt tgtacaatgt 660

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gggaattttg ttaccytttt aatcaagggc aacttccttt tccagcacta ccattgtaag 720
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ccaatttttc taacttggtg ctcatttggt gtaactcaat aaagcaaaga ctaaacattt 1620
ttataaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 1663

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<210> 450

<211> 1380

<212> DNA

<213> Homo sapiens

<400> 450

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cttctagacg aaaaaatgca aaaaaggagg ccaaagactt ttggaatgga tatgaaagca 180
tacctgagat ctatgatccc acatctggaa tctggaatga aatcttccaa gtccaaggat 240
gtactttctg ctgctgaagt aatgcaatgg tctcaatctc tggaaaaact tcttgccaac 300
caaactggtc aaaatgtctt tggaagtctc ctaaagtctg aattcagtga ggagaatatt 360
gagttctggc tggcttgtga agactataag aaaacagagt ctgatctttt gccctgtaaa 420
gcagaagaga tatataaagc atttgtgcat tcagatgctg ctaaacaat caatattgac 480
ttccgcactc gagaatctac agccaagaag attaaagcac caacccccac gtgttttgat 540
gaagcacaaa aagtcataata tactcttatg gaaaaggact cttatcccag gttcctcaaa 600
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aatatataga agcaatttct gtttacatgt ccttgctact tttaaaaact tgcatttatt 1320
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<210> 451

<211> 926

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (687)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (865)

<223> n equals a,t,g, or c

<400> 451

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aaagaatgag actggtaata acaacaacaa agatggatct aatcataaag ctgaaagtgg 120
agctctaata gaagctgcaa aatcaaagat acatcagtag aaagtacgag cttatatcca 180
aatgaagtct ctgaaagcat gtaaaaggga aatcaagtca gtcataaata cagctggaaa 240
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agaaatgcct ggtttgctgg ttacct                                     926
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<210> 452

<211> 1642

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (147)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (150)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1608)

<223> n equals a,t,g, or c

<400> 452

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gggctcacac ttacccgcgc ggaggancan cggccgggtg tccacccccca tcctgcgccc 180
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aatatttcag tcaataagtt ttaacagaga gaaactccct tccagcgaag tggtgaaatt 420
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<210> 453

<211> 2254

<212> DNA

<213> Homo sapiens

<400> 453

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<210> 454

<211> 1931

<212> DNA

<213> Homo sapiens

<400> 454

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<210> 455

<211> 771

<212> DNA

<213> Homo sapiens

<400> 455

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<210> 456

<211> 1169

<212> DNA

<213> Homo sapiens

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<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1167)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1169)

<223> n equals a,t,g, or c

<400> 456

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<210> 457

<211> 3249

<212> DNA

<213> Homo sapiens

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<221> misc feature

<222> (3234)

<223> n equals a,t,g, or c

<400> 457

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<210> 458

<211> 1916

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1895)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1902)

<223> n equals a,t,g, or c

<400> 458

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<210> 459

<211> 2773

<212> DNA

<213> Homo sapiens

<400> 459

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<210> 460

<211> 2031

<212> DNA

<213> Homo sapiens

<400> 460

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aagctgtcca catccctggc ctgagccgc caccatcacc tgacctgctt acgccagat 120
tttcttcaat cacatctgaa taaatcactt gaagaaagct tatagcttca ttgcaccatg 180
tgtggcattt gggcgtgtt tggcagtgat gattgccttt ctgttcagtg tctgagtgtc 240
atgaagattg cacacagagg tccagatgca ttccgttttg agaattgtcaa tggatacacc 300

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```
aactgctgct ttggatttca ccggttggcg gtagttgacc cgctgtttgg aatgcagcca 360
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aagaagatgc aacagcattt tgaatttgaa taccagacca aagtggatgg tgagataatc 480
cttcacatctt atgacaaagg aggaattgag caaacaattt gtatgttgga tgggtgtgtt 540
gcatttgttt tactggatac tgccaataag aaagtgttcc tgggtagaga tacatatgga 600
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```

<210> 461

<211> 1839

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1496)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1832)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1839)

<223> n equals a,t,g, or c

<400> 461

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gcccaggccg agcacgatgc cccctaaaaa gggaggtgat ggaattaaac cacccecaat 180
cattggaaga tttggaacct cactgaaaat tggattgtt ggattgccaa atgttgggaa 240
atctactttc ttcaatgtgt taaccaatag tcaggcttca gcagaaaact tcccgttctg 300
cactattgat cctaattgaga gcagagtacc tgtgccagat gaaaggtttg actttctttg 360
tcaataccac aaaccagcaa gcaaaattcc tgcctttcta aatgtgggtg atattgctgg 420
ccttgtgaaa ggagctcaca atgggcaggg cctggggaat gcttttttat ctcatattag 480
tgcctgtgat ggcactcttc atctaacacg tgcttttgaa gatgatgata tcacgcacgt 540
tgaaggaagt gtagatccta ttcgagatat agaaataata catgaagagc ttcagcttaa 600
agatgaggaa atgattgggc ccattataga taaactagaa aaggtggctg tgagaggagg 660
agataaaaaa ctaaacctg aatatgatat aatgtgcaaa gtaaatcctt gggttataga 720
tcaaaagaaa cctgttcgct tctatcatga ttggaatgac aaagagattg aagtgttgaa 780
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gacaaacaaa ttatttttat ttgttttaaa attaaaatac tgtgtacccc ccccccncyc 1500
atgaaatgca ggttactaa atgtgaacag ctttgctttt cacgtgatta agaccctact 1560
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catgtatgcc aagcctgaca catttgacag tgaggacaat gtggcttgct cctttttgaa 1680
tctacagata atgcatgttt tacagtactc cagatgtcta cactcaataa aacatttgac 1740
aaaaccaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1800
aaaaaaaaaa aaaaaaaacc ccgggggggg gnccccaan 1839
```

<210> 462

<211> 779

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (26)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (731)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (737)

<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (759)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (762)
<223> n equals a,t,g, or c

<400> 462
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gaggcagggg agacaagcca ggcacgatgg ccaccttccc accagcaacc agcgccccc 180
agcagccccc agggccggag gacgaggact ccagcctgga tgaatctgac ctctatagcc 240
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ccaacaccaa ccgccccagc cctggcgggc acgagaggaa actggtgacc aagctgcaga 360
attcagagag gaagaagcga ggggcacggc gctgagacag agctggagat gaggccagac 420
catggacact acaccagca atagagacgg gactgcggag gaaggaggac ccaggacagg 480
atccaggccg gcttgccaca cccccaccc ctaggactta ttcccgctga ctgagtctct 540
gaggggctac caggaaagcg cctccaaccc tagcaaaagt gcaagatggg gagtgagagg 600
ctgggaatgg agggcagaic caggaagatc ccccagaaaa gaaagctaca gaagaaactg 660
gggctcctcc aggttggcag caacaataaa tagacacgca cggarccam aaaaaaaaaa 720
aaaagggsgg nccggancca attggcctaa agggggggnt tncaattaat gggccgggt 779

<210> 463
<211> 1717
<212> DNA
<213> Homo sapiens

<220>
<221> misc feature
<222> (5)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (27)
<223> n equals a,t,g, or c

<400> 463
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tgatctttga tgactattac wcataacagc actctagcac cttwtcttac tggcatggac 120
ttcctcatgg actgctactt catggatgat agcttcattg ctttgggtag ggatttaagg 180
tagtcaaggg gaaaatacgc attttattac aggtcttaac atcaggcaac tttcaacttt 240
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gttatattca ttggtggctt accttatcaa actgtgcat taatcctttc acagacatag 360
gtaaggaaga gaacaaccag tggattcagg ggacaattat ctatctccaa ataataaggct 420
tttatttctt gcagctaact ttttcagtga ttctagcaga tgccatctag tacatccttg 480
atcttgttts tttcgtgaga gatctcgcca tggcagcatc ttgttaagta agtgtaattg 540

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cacatgcaca aaagacttaa ctagctttac atttagcagt cagttgggta gattagggtt 600
catagtaaat gaataggaat agaaagaata ggaagtgttt ttattttcca gtagtaattc 660
cgtggattcc atttgaccca gtttactatc agttcagttc aggtagattt ggttcaactt 720
ttgggtgggtt ttggctctag gatattcttg actttaatat cctagaactt actgagtcct 780
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gatttgtagc tacctactgt gcctgacttg gtgcctgtgt gaggattaag cccttagtct 1620
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<210> 464

<211> 828

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (787)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (819)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (827)

<223> n equals a,t,g, or c

<400> 464

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ggcggcggag gctgaccccc taggacgctt cacgtgtccc gtgtgcttag aggtgtacga 120
gaagccggta caggtgccct gcggacacgt cttttgtctt gcatgcctgc aggaatgtct 180
gaagccgaag aagcctgtct gtgggggtgtg tcgcagcgct ctggcacctg gcgtccgagc 240
cgtggagctc gagcggcaga tcgagagcac agagacttct tgccatggct gccgtaagaa 300
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catggaaggt gtgaaggcca ccattaagga tgcatctctt cagccaagga atgttccaaa 420
ccgttacacc tttccttgtc cttactgtcc tgagaagaac tttgatcagg aaggacttgt 480
ggaacactgc aaattattcc atagcacgga taccaaactc gtggtttgtc cgatatgtgc 540

```

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ctcgatgccc tggggagacc ccaactaccg cagcgccaac ttcagagagc acatccagcg 600
ccggcaccgg ttttcttatg acacttttgt ggattatgat gttgatgaag aggacatgat 660
gaatcagggtg ttgcagcgct ccatcatcga ccagtgaagc gagtccgtgc ttgctatctg 720
tctcatgtta cagagcttcc attacatatt aaacgtgaaa tctatgaaaa aaaaaaaggg 780
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<210> 465

<211> 1173

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (137)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1166)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1168)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1171)

<223> n equals a,t,g, or c

<400> 465

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gcgtttcagg cccttgntca ctcaatgacc tccagttctt tagatacaac agtaaagaca 180
ggaagtctca gcccatggga ctctggagac aggtggaagg aatggaggat tggaagcagg 240
acagccaact tcagaaggcc agggaggaca tctttatgga gaccctgaaa gacatygtgg 300
agtattacaa cgacagtaac ggggtctcacg tattgcaggg aaggtttggt tgtgagatcg 360
agaataacag aagcagcggg cattctggaa atattactat gatggaaagg actacattga 420
attcaacaaa gaaatcccag cctgggtccc ctctgaccca gcagcccaga taaccaagca 480
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atttgagac cgaagactgg gatgcctgtc ttgagtagac ttggacccaa aaaatcatct 1080
caccttgagc ccacccccac ccattgtctt aatctgtaga agctaataaa taatcatccc 1140

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tccttgcccta gcaaaaaaaaa aaaaangngg ngg

1173

<210> 466

<211> 521

<212> DNA

<213> Homo sapiens

<400> 466

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agcagaagaa gaagcggacc ttccgcaagt tcacctaccg cggcgtggac ctcgaccagc 120
tgctggacat gtcctacgag cagctgatgc agctgtacag tgcgcgccag gcggcggctg 180
aaccggggcc tgcggcggaa gcagcactcc ctgctgaagc gcctgcgcaa ggccaagaag 240
gaggcgccgc ccatggagaa gccggaagtg gtgaagacgc acctgcggga catgatcatc 300
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gagatcaagc ccgagatgat cggccactac ctgggcgagt tctccatcac ctacaagccc 420
gtaaagcatk gccggccccg catcggggcc acccactsct cccgmttcat ccctctcaag 480
taatggctca gytaataaag gcgsacatga ctccaaaaa a 521

<210> 467

<211> 1428

<212> DNA

<213> Homo sapiens

<400> 467

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tgagcaccct tacctgaccc catccccga atccctgag cactgggcca gcccctcacc 180
tccctccctc tcagactggt ccgaatccac gcctagccca gccactgcca ctggggccat 240
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cctttctttc tctgtctctt ccttcctttt agtctttttc atcctcttct ctttccacca 480
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gaatagttaa cactcaaaaa aaaaaaaaaa aaaaaacttg agggggggg 1428

<210> 468

<211> 3463

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1187)

<223> n equals a,t,g, or c

<400> 468

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gccctgccgc gcccacatccg caacctggag gtcaagttca ccaagatatt tatcaacaat 180
gaatggcacg aatccaagag tgggaaaaag tttgctacat gtaacccttc aactcgggag 240
caaatatgtg aagtgggaaga aggagataag cccgacgtgg acaaggctgt ggargctgca 300
caggttgccct tccagagggg ctgccatgg cgccggctgg atgccctgag tcgtgggcgg 360
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acgatggata cagggaagcc atttcttcat gcttttttca tcgacctgga gggctgtatt 480
agaacctca gatactttgc aggggtgggca gacaaaatcc agggcaagac catccccaca 540
gatgacaacg tgtgtgcttc accaggcatg agcccattgg tgtctgtggg gccatcactc 600
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acagcatagc aaatcctagg ataattcacc tcctcatttg acaaatcaga gctgtaattc 2460
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<210> 469

<211> 621

<212> DNA

<213> Homo sapiens

<400> 469

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ctgttgatcc aggggtctaa tcaggcctgt gtctgcctcc ttcttgaata gccagtgaa 180
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gaccagtgtt gtctcccggg acattgacac agcagccaag tttattgggtg ctggggcagc 300
cacagtgggt gtggctgggt caggggctgg cattggaacc gtggttggtg gcttgatcat 360
tggtctatgcc aggaaccggt ctctcaagca gcagctcttc tcctatgcc a ttcttggtt 420
tgccctgtct gaggccatgg ggcttttctg tttgatggtc gccttcttca tcctcttcgc 480
catgtgaggg tccatggggg gtcaccggcc tgttgctact gcaactccac accattcttg 540
gtgctggggg gtgttaagct ttaccattaa acacaacgtt tctctaaaaa aaaaaaaaaa 600
aaaaaaaaaa aaaaaaaaaa a 621
```

<210> 470

<211> 1833

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (126)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (386)

<223> n equals a,t,g, or c

<220>

<221> misc feature
<222> (524)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1798)
<223> n equals a,t,g, or c

<220>
<221> misc feature
<222> (1812)
<223> n equals a,t,g, or c

<400> 470

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cccgcatttt agagactttg gtcatgcttc ttcttcttgc gttactcatt cttgggatag 660
tgtgggtagc ttcagcactc attgacaacg atgccgcaag catggaatct ttatatgatc 720
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<210> 471
<211> 3202
<212> DNA
<213> Homo sapiens

<220>
 <221> misc feature
 <222> (4)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (3160)
 <223> n equals a,t,g, or c

<220>
 <221> misc feature
 <222> (3180)
 <223> n equals a,t,g, or c

<400> 471
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 ggctcatagt cgtatcaggg gtcgggacca aggcccaaat gtctgtgccc ttcaacagat 180
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 gggatcccttc acttactttg caccgagtaa tgaggcttgg gacaacttgg attctgatat 480
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tttacgcggg gcatgccgac gt 3202

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<210> 472

<211> 941

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (927)

<223> n equals a,t,g, or c

<400> 472

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cattggaccc aggcagatgy aaaaaattca cagaactatg atttggactc aagggtttgt 240
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aacatgttgg cttttctctt ggacgtggga gaaattgaaa agaaggggaa ggggaagaaa 900
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<210> 473

<211> 1279

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (1144)

<223> n equals a,t,g, or c

<220>

<221> misc feature

<222> (1273)

<223> n equals a,t,g, or c

<400> 473

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aaagaagagt ttctccagag gaagcaatca aatgtgaaga caaattcaca aaatccaaaa 180
ctgtttatag cattcttcgt catgttgctg aggtgttaga atacaccaag gatgagcagc 240
tggaagcct attccagagg actgcctggg tctttgatga caagtacaag agacctggat 300
atggtgccta tgatgcattt aagcatgcag tctcagacct atctattttg gatagttag 360
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aggctgtcaa aattcgagca gatattgaag tggcttggtt tggttatgaa ggcattgatg 480
ctgtaaaaga agccctaaga gcagggttga attgttctac agaaaacatg cccattaaga 540
ttaatctaata agtcctcctt cggatatgta tgactacgac aaccttgag agaacagaag 600
gcctttctgt cctcagtcga gctatggctg ttatcaaaga gaagattgag gaaaagaggg 660
gtgtgttcaa tgttcaaatt gagcccaaag tggtcacaga tacagatgag actgaacttg 720
cgaggcagat ggagaggctt gaaagagaaa atgccgaagt ggatggagat gatgatgcag 780
aagaaatgga agccaaagct gaagattaac tttgtgggaa acagagtcca atttaaggaa 840
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aacatcaaat aaatttcttg gatattttaa aaaaaaaaaa aaaaaggggg gggccttaaa 1260
gaaccaagtt tantttggg                                     1279
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<210> 474

<211> 3209

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

<222> (427)

<223> n equals a,t,g, or c

<400> 474

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acgcacggtc gcttcctgga aattggcaaa ttcgacctt ctcagaacca mccgctcggc 180
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